MUSICA UNIVERSALIS

AN ORIGINAL COMPOSITION FOR CHAMBER ENSEMBLE

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

DOCTOR OF ARTS

BY

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MUNCIE, INDIANA

DECEMBER, 2017

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ACKNOWLEDGEMENTS

This dissertation is the culmination of over a decade of collegiate studies in music. I have lost count of how many people have helped me during my collegiate studies; I wish to humbly name a few of note who have have been my rock and comfort.

I cannot give enough thanks to my mother, Robin Hayes. She has received countless phone calls seeking advice and counsel, been a constant wellspring of encouragement and offered words of wisdom to somebody who has had to figure out college and being a professional musician without a role model family member. I likewise cannot give enough thanks to my adopted family, the Hands (particularly Barbara and Greg Sr.) They gave me a home when I didn't have one and have encouraged me every step of the way, plus they tolerated me as a broke Master's student (that's an act of God in itself.)

I would also like to thank each of the members of my committee. They have all provided advice as I drafted this thesis, especially Amy and Jody.

I also want to thank, my close friends, pseudo-advisors, and mentors Eleanor Trawick, Wes Flinn, and Markie Oliver. Eleanor in particular helped me figure out what it means to be a music professor and music theorist. Wes mentored me and offered professional counsel with more ardor than any professor I have previously studied with.

Last of all, thank you to Chris Arrell. Chris is a fantastic composer who has always known the perfect thing to say. Even though I studied with him for only a year, his mark is noticeable on my music. He was also gracious and kind enough to let me study and present some analysis on his work *Breathless* in this dissertation.

LIST OF EXAMPLES

CHAPTER 1: Introduction

Astrology, history, and cultural studies have long been fascinations of mine. I also come from a family deeply interested in multiple facets of spirituality. When my brother and I were born, my parents did more than simply baptize us. Detailed astrological birth charts were made for each of us. While I am not a practitioner, indeed taking a stance more evocative of James Randi's skepticism, the level of detail attributed to every star and every planet fascinates me. I have pursued graduate degrees for two primary reasons. I have a strong desire to understand the history of the world around me, and learning about cultural trends helps me feel connected to the music I perform. I want to do more than perform music that I enjoy; I want to understand the values that shape a composer's aesthetics and the societal expectations that influence how she or he views the world.

In early 2016, I began thinking about what I wanted my dissertation, the capstone of my studies, to be. Creating a work of music allows me to present a piece of myself. I decided to combine the medieval philosophy *Musica Universalis* with concepts found in astrology because both concepts are related to the study of stars. Using astrology as a reference also allows me to make a pun out of the name *Musica Universalis*; the work depicts music of the universe and is part of my catalogue of music written at a university.

After figuring out the theme of my dissertation, I decided on my instrumentation. I typically don't like writing music unless I know it is likely to be performed and tend to write for

individuals or small ensembles who have agreed beforehand to play my music. From a practical standpoint, I prefer to write works that are more likely to be performed at conferences. However, writing a dissertation is a completely different project. My works for conferences have tended to be chamber works of less than 10 minutes in duration and with very few instruments. Right after deciding on the theme of my dissertation, I was approached by Ball State's viola and clarinet professors and asked to write a work for them. This gave me the idea for a unique chamber ensemble. The professors of viola, flute, and harp regularly perform together, with an occasional pianist substituting for harp. I imagined writing a work for this trio and added clarinet and piano to round out the ensemble.

After deciding on the instrumentation and theme, I was able to begin planning the large-scale organization of *Musica Universalis*. I wanted to write a substantial work of considerable length but also create something likely to be performed at conferences. To this end, I resolved to write four movements that could be performed individually as well. The organization of these movements is derived from the four divisions of zodiac signs based on elements. Each of the four movements is inspired by a star from a zodiac sign, with four of the twelve zodiac signs used.

Musica Universalis is a chamber work for flute, clarinet, viola, harp, and piano. As a chamber work, it follows a tradition established in Western music as far back as the late renaissance. Chamber music that I have performed requires the performers to regularly rehearse with each other to the point of being intimately familiar with one another. When I think of the dinner parties at which Schubert's music was heard, I am reminded that, historically, chamber

music has been performed in intimate spaces. This intimate nature resonates well with me; it mirrors the type of space in which the aforementioned Ball State professors rehearse.

Current trends in new music performance have also encouraged me to write a chamber work. The Imani Winds woodwind quintet, the International Contemporary Ensemble, the Bent Frequency, the JACK quartet, the C4 ensemble, and Roomful of Teeth are examples of the many musical entrepreneurs who have formed chamber ensembles specializing in contemporary chamber music. Even Ball State's New Music Ensemble specializes in performing chamber works. *Musica Universalis* also calls for a conductor. This decision allowed me to give individual parts more complicated gestures. It is also a typical necessity for contemporary works and therefore a decision with which I am comfortable. This complexity is present in some fashion in all movements of the score. Micropolyphony, drones, and polyrhythmic writing are utilized in each movement. Adding a conductor allows the performers to focus on individual lines and receive entrance and exit cues without figuring out either how their individual line interplays with others.

Chapter 2 introduces astrological terms used throughout discussions in later movements. Chapter 3 of this dissertation is a review of chamber music literature with a focus on twentieth-century works as well as works sharing a theme similar to *Musica Universalis*. Chapter 4 takes a closer look at two of the works discussed in chapter 3: John Luther Adams' *The Wind in High Places*, and Chris Arrell's *Breathless*. Chapters 5 through 9 present a description and analysis of both the large-scale structure of *Musica Universalis* and the four individual movements. The final chapter presents my conclusions, including what I have learned by writing this piece.

CHAPTER 2: Astrological Terms

Astrology is a core concept in *Musica Universalis,* yet it is also a topic that is difficult to write about. Stars and celestial objects have been a source of human fascination dating back to the start of civilization. In Egyptian, Grecian, Roman, Norse, and Judeo-Christian traditions, God/s either dwell in the heavens or are directly associated with heavenly objects. *Musica Universalis* takes its name from the same-named philosophy dating from ancient Greece.[1] This philosophy stated that celestial objects, such as the sun and moon, create a music from their movements in the skies.[2] Traditionally, the concept is viewed as a mathematical idea rather than a musical one. The movement of each celestial object was thought to create specific wavelengths that produced a unique series of harmonics.[3] Rather than searching for the musical properties of each heavenly object, practitioners sought to find the mathematical relationships between each celestial object in order to understand how they functioned together. Harmony in this context referred to the interactions of the objects in a manner similar to the modern day usage of "harmonious," "in accord with," or "working together."

When developing the concept for my dissertation, I wanted to revive this idea in a manner both reflective of and fitting for the twenty-first century. Celestial-based religions and philosophies have somewhat decreased with the advent of space exploration and astronomy, but

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[1] James Haar, "Music of the Spheres," *Oxford Music Online*, found on http://www.oxfordmusiconline.com
[2] Ibid.
[3] Ibid.

astrology is still quite alive in public perception. It is exceptionally rare in my experience to find somebody who practices astrology as dogmatically as a religious practice, but Gallup polls from 2005 have found that roughly 20% to 25% of Americans, Canadians, and Britains believe it to be an effective tool for predicting the future.[4] Shoshanah Feher states in her article "Who Looks to the Stars?," that Gallup polls in 1970 through 1990, asking the same question, supported this amount as well.[5] The basic premise of astrology is similar to the medieval *musica universalis* philosophy: the stars and their interactions with one another can be used to divine personal information and predict the future of an individual.

Academic writings on and explanations about the details of astrology are somewhat sparse. Paul Thagard offers the following potential explanations as to why this could be:

> "Most philosophers and historians of science agree that astrology is a pseudoscience, but there is little agreement on <u>why</u> it is a pseudoscience. Answers range from matters of verifiability and falsifiability, to questions of progress and kuhnian normal science..."[6]

Astrology has frequent associations with the occult and magic, something to which scholars generally cannot study or contribute. As a result, academic studies on astrology appear to be more focused on exploring the culture of practitioners than on establishing and anthologizing a doctrine. "Doctrine" is instead learned through word of mouth, or from specially created websites/books by authors typically far removed from academia. I have found a plethora of definitions and explanations, but these have come from people claiming to be psychics, avid practitioners, or people interested in creating encyclopedias. To complicate matters, no concept

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[4] Linda Lyons, "Paranormal Beliefs Come (Super)Naturally to Some," found on http://www.gallup.com/poll/19558/paranormal-beliefs-come-supernaturally-some.aspx.
[5] Shoshanah Feher, "Who Looks to the Stars? Astrology and its Constituency," *Journal of Scientific Study of Religion* (Mar., 1992), 88.
[6] Paul Thagard, "Why Astrology is a Pseudoscience," *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* (1978), 223.

is officially canonic in nature. There is no official governing body that determines the official rules understood by practitioners. Information is instead shared in a manner similar to word-of-mouth. There appears to be a general consensus on concepts, but details and explanations of these concepts are varied. There is a level of complexity behind ideas found in astrology, however. This complexity requires practitioners to actively study concepts. Paul Thagard attempts to summarize the complexity as such:

> "It would be most unfair to evaluate astrology by reference to the daily horoscopes found in newspapers and popular magazines. These horoscopes deal only with sun signs, whereas a full horoscope makes references to the 'influences' also of the moon and the planets, while also discussing the ascendant sign and other matters.
>
> Astrology divides the sky into twelve regions, represented by the familiar signs of the Zodiac...the sun sign represents the part of the sky occupied by the sun at the time of birth...The ascendant sign, often assumed to be at least as important as the sun sign, represents part of the sky rising on the eastern horizon at the time of birth, and therefore changes every two hours. To determine this sign, accurate knowledge of the time and place of birth is essential….Each planet is said to exercise an influence in a special sphere of human activity; for example, Mars governs drive, courage and daring, while Venus governs love and artistic endeavor. The immense number of combinations of sun, ascendant, moon and planetary influences allegedly determines human personality, behavior and fate."[7]

The following is a list of concepts and terms relevant to the writing process and inspiration for *Musica Universalis*:

- **Zodiac**: A set of twelve constellations that serve as the fundamental system of organization for Western astrological practices. Each constellation, or **Sign**, has specific emotional properties associated with it in astrological mythos. Additionally, these signs follow a specific order similar to a calendar. Of these twelve, four are relevant to *Musica Universalis*: Aries, Taurus, Gemini and Scorpio, as will be subsequently explained.

[7] Ibid., 223–224.

- **Aries**: The first of the twelve signs, Aries starts the zodiac calendar. It is traditionally depicted as a ram. Emotional properties typically associated with Aries are impulsiveness, bravery, leadership, action, and drive.[8]
- **Taurus**: The second zodiac sign and immediately follows Aries in the calendar. It is depicted as a bull. Emotional properties traditionally associated with Taurus are stubbornness, perseverance, determination, reliability, and steadfastness.[9]
- **Gemini:** The third sign in the calendar, and is depicted as twins. Emotional properties traditionally associated with Gemini are quick-wittedness, shrewdness, artistry, intelligence, versatility, and capriciousness.[10]
- **Scorpio**: The eighth zodiac sign and roughly coincides with November. It is depicted as a scorpion. Emotional properties that are traditionally associated with Scorpio are resourcefulness, secrecy, mystery, intense-emotion, analytical ability, and meditativeness.[11]
- **Hamal**: The brightest star in the constellation Aries. Its name comes from Arabic for "Head of the Ram."[12]
- **Aldeberan**: The brightest star in the constellation Taurus. Its name comes from Arabic for "Follower."[13]

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[8] James Lewis, *The Astrology Encyclopedia* (Detroit, MI: Visible Ink Press, 1994), 33–34.
[9] Ibid., 504–505.
[10] Ibid., 222–223.
[11] Ibid., 471–472.
[12] Richard Hinckley Allen, *Star Names: Their Lore and Meaning* (New York: Dover Publications, 1963), 80 – 81.
[13] Ibid., 383 – 386.

- **Pollux**: The brightest star in the constellation Gemini. Its name comes from the Grecian mythological character Pollux. In Grecian mythos, Pollux is one of the twins referred to by Gemini. He is a son of Zeus and one of the Argonauts.[14]
- **Antares**: The brightest star in the constellation Scorpio. Its name comes from the Greek for "Equal to Ares" on account of its reddish hue. Mars, the roman equivalent to Ares, is one of the easiest objects to detect in the night sky that also is reddish in color.[15]
- **Elements:** A system of categorization within astrology where the twelve traditional signs are placed within one of four elements. The elements are Fire (Aries, Leo, Sagittarius), Earth (Taurus, Virgo, Capricorn), Air (Gemini, Libra, Aquarius), and Water (Cancer, Scorpio, Pisces). Each movement of *Musica Universalis* is named after a star in one of the four elements.

[14] Ibid., 233–234.
[15] Ibid., 364–367.

CHAPTER 3: Review of Music Literature

Because *Musica Universalis* is a chamber work, instrumentation is an important element worth discussing. There does not appear to be a well-known classical work that uses flute, clarinet, harp, piano, and viola. However, there is a significant amount of repertoire written for my core instrumentation of flute, harp, and viola. One of the first major, well-known works with this instrumentation is Debussy's *Sonata for Flute, Harp, and Viola* (1916). After Debussy's sonata, the majority of compositions for this ensemble tend to be lighthearted in nature and short in duration. Even settings by well-known composers tend to be playful and musically accessible. For example, Libby Larsen's *Trio in Four Movements* (2006) contains both advanced techniques for the instruments, such as flutter tones and jeté, and a semi-fluid system of tonality. The melodies are quite accessible, however, and borrow sounds from non-Western music, such as the Japanese pentatonic scale (used in the first movement). William Matthias' *Zodiac Trio* (1976) is another work similar in harmonic language to Larsen's *Trio in Four Movements*. Both works are quite melodically driven.

The choice of clarinet and piano are inspired by another chamber work: Igor Stravinsky's Bb clarinet, violin, and piano arrangement of his *L'Histoire du Soldat* (1920). This instrumentation itself is a subset of the Pierrot ensemble (flute, clarinet, violin, cello, piano, and soprano) and is therefore one that is easy for which to find performers. Works for this ensemble are also typically melodic, and several famous composers have composed works for the

ensemble. The examples I have found also tend to have jazz-like harmony or non-traditional classical musical elements. For example, the harmonic language and orchestration choices of Bartok's *Contrasts* (1938) use blues gestures over an advanced polytonal harmonic language. Aram Khachaturian's *Trio for Violin, Clarinet, and Piano* (1932) combines jazz harmonies with blues melodies and folk-music-like gestures, such as turns on important notes and repetitive melodies over a drone chord or progression. Darius Milhaud's *Suite for Violin, Clarinet, & Piano* (1936) uses the tresillo rhythm in the first movement and stylistically quotes *L'Histoire du Soldat* in the third movement.

While the number of major works sharing an instrumentation with *Musica Universalis* appears to be non-existent, there is a wellspring of music that takes inspiration from celestial objects. Besides the aforementioned *Zodiac Trio*, the most famous similarly themed work is Gustav Holst's *The Planets* (1921). George Crumb's collection of works *Makrokosmos* (1972–1974) for amplified piano is very similar in theme to *Musica Universalis*. It has twelve movements, one for each sign in the zodiac, and it uses advanced techniques, such as plucking the piano strings and dampening strings by placing a finger on them. Each movement is named after a scene that the composer associates with the sign. For example, the movement for Aries is labeled "Spring Fire. Aries" and begins with high-energy runs. For another example, Terry Riley was commissioned in 2000 by the Kronos Quartet to write music based on recordings released by NASA, which became *Sun Rings* (2002). In the 1970s, Stockhausen released the musical theater work *Sirius* (1975–1977).

Given the contrasting tones between all aforementioned works, I also wanted to look at modern chamber works as an inspiration. I additionally reviewed works that either have similar orchestrations to *Musica Universalis* or are by contemporary composers. Olivier Messiaen's *La Mort du nombre* (1930) is stylistically similar to his *Preludes* than *Catalogue d'Oiseaux,* and is more evocative of Debussy's late music. Set for tenor, soprano, piano, and clarinet, it heavily features dialogue between the clarinet and piano. *Quatour pour la fin de temps* (1940) adds clarinet to an established piano trio and uses a harmonic language that shies away from tertian harmony. George Crumb's string quartet *Black Angels* (1970) uses a very advanced harmonic language and is similar in style to *Makrokosmos*. It is also evocative of a variety of stylistic periods and utilizes many sound effects. Another work of note is his work *Vox Balanae* (*Voice of the Whale*) (1971) for electric flute, cello, and amplified piano. It calls for a variety of specific, advanced techniques. For example, the performers are instructed to wear black masks while performing. Other advanced performance techniques used in *Vox Balanae* include: the flautist sings into the flute while playing it, the pianist uses paper clips to strum strings, and the cello performs glissandi as harmonics.

There are also contemporary works that harmonically strike a balance between the Libby Larsen and William Mathias trios and *Black Angels*. Because of this, I studied these works while composing *Musica Universalis* and give special attention to them in later chapters. One work is John Luther Adams' *The Wind in High Places* (2011) for string quartet. It uses an extensive amount of bright timbres and harmonics and is built entirely around texture rather than melody, to the point of lacking a discernible or singable melody. Chris Arrell's *Breathless* (2016), for piano trio, is similarly built around timbre exploration, yet it has a harmonic language closer to

Messiaen's. Both of these works were written within the past five years and share a similar musical language and breadth of techniques.

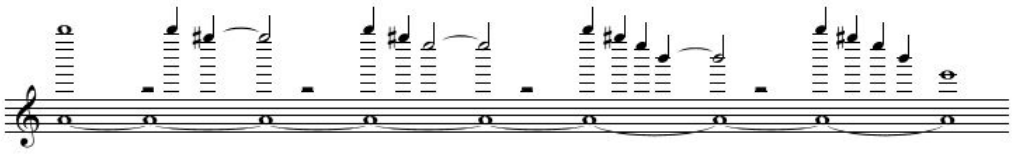
CHAPTER 4: Compositional Techniques in Sampled Contemporary Works

Musica Universalis is a twenty-first century chamber work that uses contemporary performance and compositional techniques to explore new sound combinations. However, its formal structure is fairly standard. A brief exploration of techniques used in selected contemporary chamber music can therefore help place *Musica Universalis* within the context of that repertoire. Rather than writing for a traditional chamber ensemble, I chose to write *Musica Universalis* for professors at Ball State who enjoy performing with one another. My chosen instrumentation also allows me to explore some interesting orchestrations, and I have not found other major works sharing the same combination of instruments. This chapter will briefly look at two existing works for more traditional ensembles (John Luther Adams' *The Wind in High Places* and Chris Arrell's *Breathless*) that explore similar sound effects or compositional techniques as *Musica Universalis*.

These two works were selected and analyzed because they are contemporaries of *Musica Universalis*. Both works are chamber pieces that were written within the past 10 years. It is therefore valuable to compare compositional techniques used in all three works in an effort to establish how *Musica Universalis* fits within the greater narrative of early twenty-first-century composition. I compare compositional methods discussed in the analysis with segments found in *Musica Universalis*.

The Wind in High Places

John Luther Adams' string quartet *The Wind in High Places* utilizes techniques similar to *Musica Universalis*. Both works attempt to explore the concept of, "far above," specifically in the context of using musical techniques to depict high locations. Two movements, "Above Sunset Pass" and "Maclaren Summit," evoke specific places. As shown in Example 4.1, the score also uses noticeably high registers. Adams' program notes instruct the performers that: "all the sounds are produced as natural harmonics or open strings." Instead of placing harmonic symbols over these notes, Adams wrote the notes as they were intended to be heard. The effect is something that both sounds very high and is written very high on the score.

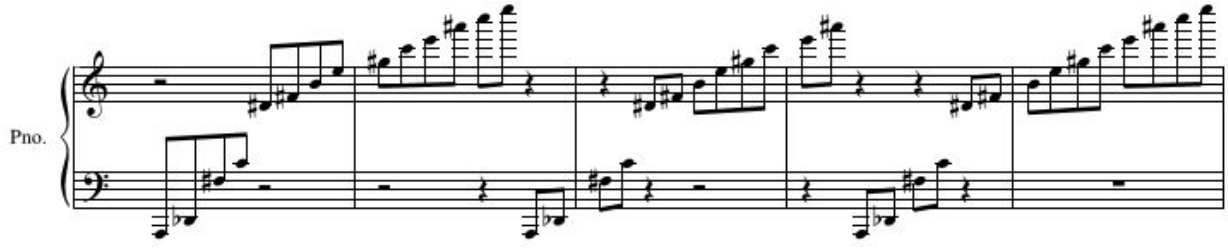


Example 4.1: *The Wind in High Places*, Opening Gesture, (measure numbers not provided, transcribed by Salvatore LoCascio) (violin I and II)

Exclusively using natural harmonics and open strings severely limits the amount of tones available to the composer. Thirds are available only in the highest register; and using only harmonics and open strings to produce tones makes it easier to harmonize via fifths and fourths, the first two pitches of the overtone series. Adams compensates for this by organizing sections with small motivic gesture rather than longer melodies. Example 4.1 effectively highlights this compositional approach. The violin I begins by performing B7. After a half rest, B7 and G#7 are

performed. The next gesture is a descending triad of B7, G#7 and E7. The example ends with the violin I performing B7, G#7, E7, B6, and E6. Each gesture following the half rests adds one pitch to what was previously performed. The effect sounds like an elongated, arpeggiated E major triad. The violin has less available harmonics to perform as it descends, so G#6 is omitted from the progression.

Creating gesture modulations by adding or removing pitches is a technique I use in *Musica Universalis*. To show this, Example 4.2 is an excerpt taken from "Pollux." In this example, the piano is performing a background gesture that serves as the backbone for this section. This gesture's length modulates by adding and/or removing pitches from the progression. The first iteration of this pattern lasts for one and three-quarters of a measure. The pitches performed in order are: A1, Db2, F#3, C4, D#4, F#4, B4, E5, G#5, C6, E6, A#6, C7, and E7. When this pattern repeats in measures 134 to the first beat of 136, the duration is only one and a half measures long. The sequence omits A#6 and C7. The third iteration, lasting one and three-quarters of a measure, repeats the first gesture. Another similarity is the intervallic distance between pitches in different registers. The intervals generally condense as the register increases. The intervallic distance between the first four notes of the progression in Example 4.2 is M3, +10, and $^{0}5$ respectively. The second half of the gesture predominantly uses thirds.



Example 4.2: "Pollux," from *Musica Universalis*, m. 133 – 137 (piano)

The form of "Above Sunset Pass" is ABCBA. As the work progresses, there is a pedal or combination of pedals present that descends by fifths. This allows the performer to play these pedals using natural octave harmonics or open strings. The progression of lowest pedal tones are: A4 (harmonic, violin II, then cello), D4 (cello), G3 (harmonic, cello) D3 (harmonic, cello). G2 (open string, cello), and C2. Each gesture over these pedals is repeated ad libitum, and sections are identified by the specific gesture being repeated. Gesture A, highlighted above in Example 4.1, is an arpeggiated chord. Gesture B is a triad built from one of the middle tones that descends, raises an octave, and then finishes. Gesture C is an arpeggiation built from leaping up a fifth from the starting tone and descending to complete the triad. Each of these short gestures is performed in canon. Rather than developing material, Adams does any combination of the following: increase the amount of performers in each canon, change the registers of the canon, change the droned tone(s), change the instrumentation of the canon, and/or any combination thereof.

Adams also creates formal games in each of the movements. The overall large structure of the work appears to be a formal game as well. The form of "Above Sunset Pass" is palindromic. "Maclaren Summit" is a palindromic canon that has each instrument enter and leave in reverse order throughout the entire movement. "Looking Toward Hope" is a modified canon that gradually ascends over its five-minute duration. All three movements prominently feature open fifths; the first movement uses pedal fifths, the second movement is built primarily around oscillating fifths, and the last movement is organized around ascending open strings tuned in fifths. The slow-fast-slow pattern of movements creates a larger palindromic form of ABA throughout the entire work. This large-scale ternary form is further strengthened by the

drone-like nature of the fifths in the outer movements, the opening movement descending as it progresses, and the last movement ascending throughout its duration.

The Wind in High Places uses many techniques similar to *Musica Universalis*, but in either a different manner or to a different effect. As will be explored in later chapters, I am partial to using open drones as large form markers in *Musica Universalis*. I also frequently use many perfect fifths; it is an interval I am rather fond of. I frequently use high tones as drones, including harmonics in the viola, as harmonic anchors. *Musica Universalis* also features repeated ostinati based on arpeggiations or thirds throughout each movement. Lastly, *Musica Universalis'* large-scale structure is a loose mirror. It begins with a short prelude, has two large movements sharing the same form, and finishes with a short postlude.

Breathless

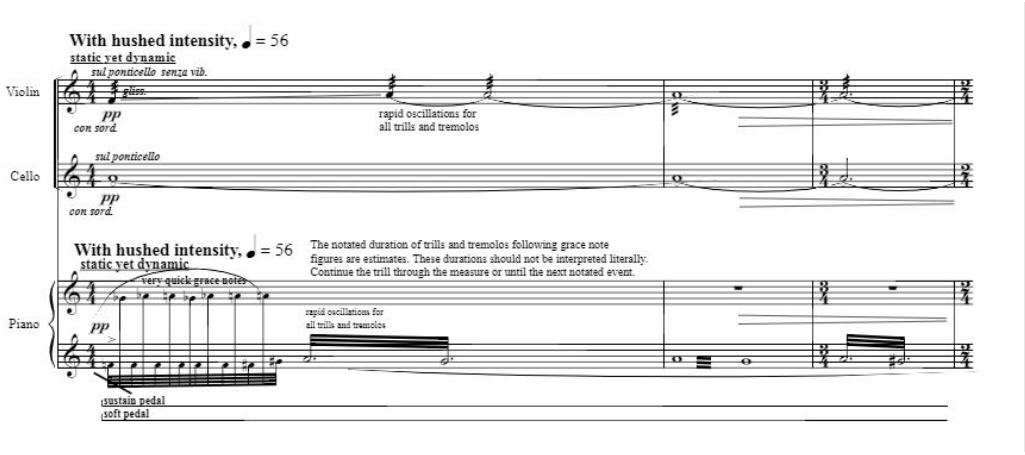
Chris Arrell's *Breathless* is a contemporary work for piano trio. Its harmonic vocabulary is more removed from traditional tonality than anything present in *Musica Universalis*, however, some of the same compositional techniques and systems of formal organization are present in smaller sections of both works. When discussing the form of *Breathless*, Arrell wrote in the program notes:

> "*Breathless* is a chain of six miniature movements played without pause. The six movements comprise two interlocking series, dubbed Kaleidoscopic Cells and Echoes...Building from a hushed whisper to a shining, luminous declaration, the 'kaleidoscopic cells' mutate from spectral dissonance (compact pitch collections) to spectral consonance (overtone series)."

This system of musical organization via short cells is one that I also use in *Musica Universalis*. "Hamal" is organized around a series of vignettes, quoting material used in later

movements. Each section of "Hamal" lasts roughly 30 seconds and contains no common material with other sections within the movement. Each section also doesn't develop; repetition with added/subtracted instruments is the only change that happens as the movement progresses. The repetition of each cell is also a popular composition approach in *Breathless*. Measures 5 and 6 are direct repetitions of measures 1 and 2 (shown in Example 4.3).

Arrell uses a wide array of harmonization and performance techniques throughout the work. He draws from spectralist practices by creating consonance and dissonance from pitch interaction rather than chord quality/presence of non-chord tones. Additionally, texture is used as a harmonic tool. In Example 4.3, the violin, cello, and piano perform sustained notes each in a different manner over the same amount of time. The cello performs a sustained, bowed A4 that is muted and on the fingerboard. The violin is instructed to perform pianissimo tremolos, which are muted, on the fingerboard, without vibrato but with a glissando from F4 to A4. Lastly, the piano performs a tremolo using each half step between F4 and A4 in the same space of time while pressing the sustain and mute pedals. This creates a cascade of all possible pitches over the major third interval with each instrument providing different textures. In effect, it is a cluster with a rough texture; it is a striking sound effect whose precision to detail is indicative of late twentieth- and early twenty-first century composition.

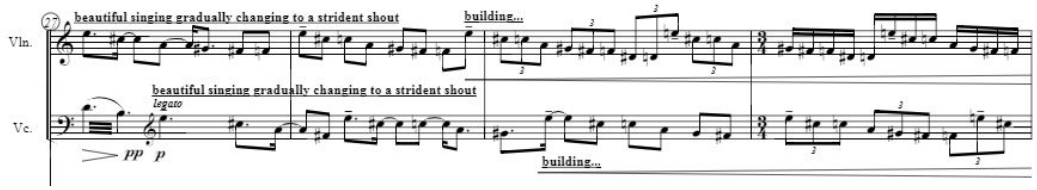


Example 4.3: *Breathless*, m. 1 – 3

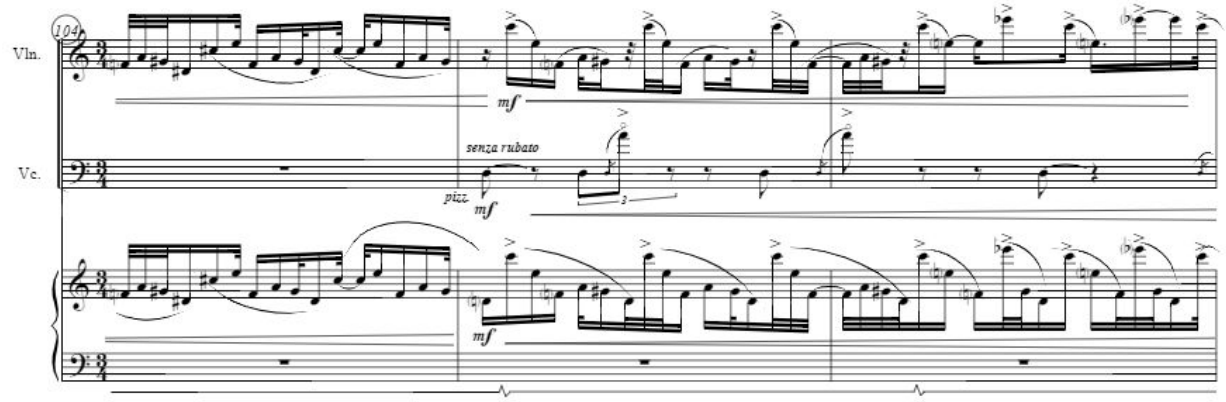
Another technique that Arrell employs is creating a contrast between the octave/unison and harmony built from intervallic combinations. He also uses micropolyphony to create a contrast between unison passages and harmonized sections. In Example 4.4a, the violin and cello perform the same melodic cell at different speeds and on different beats. The cell consists of pitches: E5, C#5, A4, G#4, F#4, F4, D#4, and D4. However, the cello does not mirror the exact pitches used in the violin. Certain pitches are omitted to compensate for longer note durations than those found in the violin. Each cello repetition of the set happens after the violin's repetition, and each repetition in the violin and cello both uses more notes and gets faster as the music progresses.

I interpret Example 4.4 to be a showcase of creating harmony by rhythmically dislocating and elaborating a unison set. Both instruments are performing in the same register and repeating the same cell. Harmony is created by the performance of this cell at different times and at different rhythmic mutations. I also believe this to be a popular compositional approach that Arrell uses to make each section unique in *Breathless*. Example 4.4b and Example 4.4c are examples built from single motives. For Example 4.4b, the violin and piano perform the same

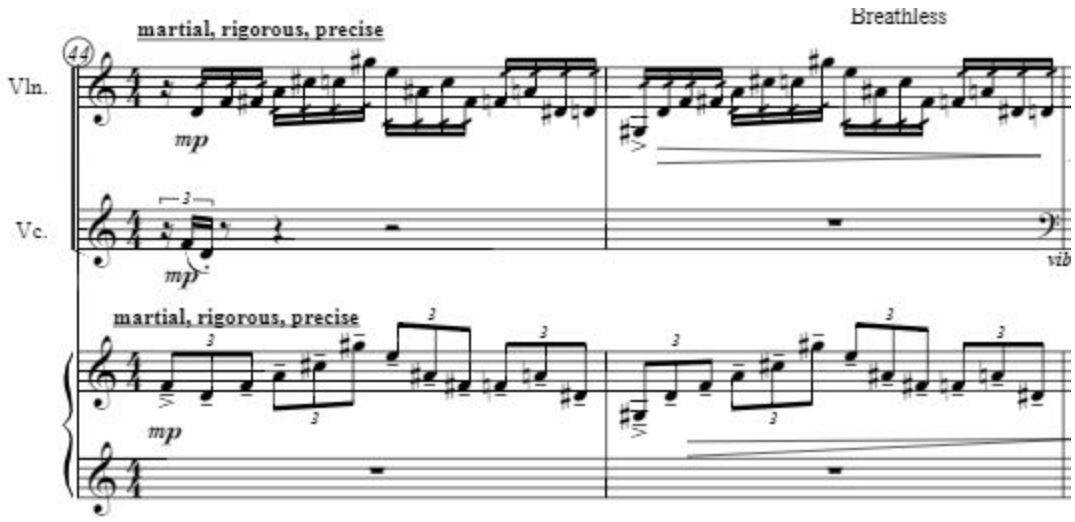
motive in unison, while the cello performs contrasting pizzicato material. This inherently makes the line quieter and more akin to a sound effect. The removal of sustain by plucking the string also makes it harder for the listener to notice that different material is being performed. Example 4.4c uses heterophony. The violin embellishes what the piano is performing and uses tremoli to add energy to the sound. However, the instruments perform the same pitch and register at the start of each beat.



Example 4.4a: *Breathless*, m. 27 – 30 (violin and cello parts)

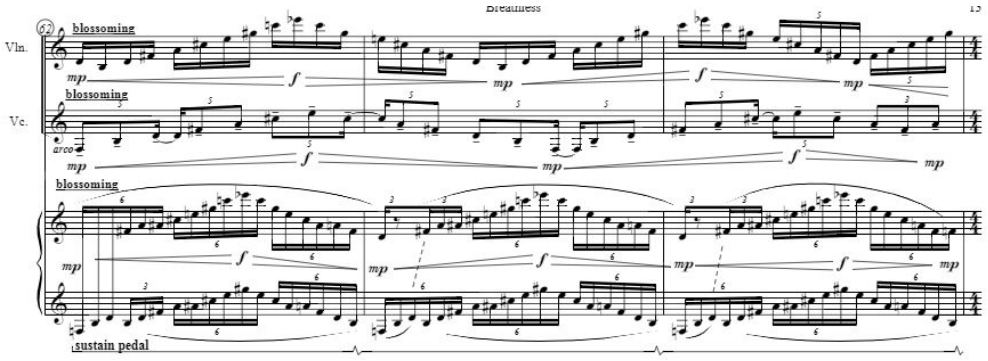


Example 4.4b: *Breathless,* m. 104 – 106

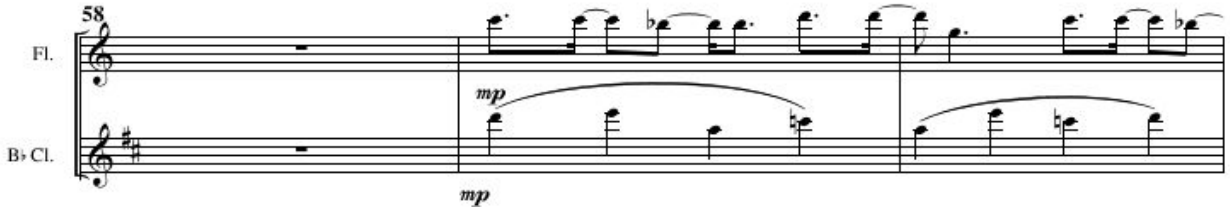


Example 4.4c: *Breathless,* m. 44 – 45

Harmony is built in Example 4.5 by applying various manipulations to the same motive. Each instrument is performing a series of rising and falling arpeggiations, however, each instrument also performs at a different rhythmic value. The violin, cello, and piano parts perform their respective arpeggiations beginning on different pitches. The piano contains a different arpeggiation in each hand; both hands typically move in the same direction. The violin performs arpeggiations as sixteenth notes with B3 as the lowest note, the cello arpeggiates quintuplets with F3 as the lowest note and E5 as the highest note, and the piano contains arpeggiations as sextuplets beginning on F3 but with Eb6 as the highest note.



Example 4.5: *Breathless*, m. 62 – 64



Example 4.6: “Aldeberan," from *Musica Universalis*, m. 58 – 60 (flute and clarinet)

The use of micropolyphony to create harmony is especially noticeable in both *Breathless* and *Musica Universalis*. Compare Examples 4.5 and 4.6. The latter is an excerpt from “Aldeberan," in which the flute and clarinet are performing material based on the same 8-note motive. The flute performs the first four notes that the clarinet performs at a different rhythmic value. They are also performing in the same register, making 4.6 quite similar to 4.5. While the flute repeats notes, the note changes are (in order): C6, Bb5, D6, G5. The clarinet’s first four notes are also these pitches and the last four are the same pitches reorganized in the following order: G5, D6, Bb5, and C6. The clarinet performs the set as quarter notes, and the flute performs its notes as dotted quarters (divided into two, repeating, dotted eighth notes). Large

scale canon is also present throughout the majority of *Musica Universalis*. This will be discussed more in the following chapters.

CHAPTER 5: Large-Scale Composition Design of *Musica Universalis*

I have found that discussing large-scale form is just as important as individual movements when talking about my compositions. When I began sketching ideas for *Musica Universalis*, I started with the large-scale form and overall musical progression. This piece is set in four movements for several reasons. The structure is evocative of the classical symphonic form, and there are four elemental categories in astrology. Writing several movements also allows me to explore several different compositional techniques, and separate, shorter movements are much more likely to be programmed on a conference or festival than a longer work lasting 20 minutes.

After deciding to write four movements, I determined the structure of each one and how it functions within the whole work. My original plan was to write four movements that were each roughly the same length. Each one would also contain enough material, a substantial duration, and formal development, to be suitable for a conference performance. Individual movements were to be four or five minutes long, which would make the total work sixteen to twenty minutes long. My desire to write a twenty-minute work was pragmatic in nature. Works that are fifteen to twenty minutes are substantial but also short enough to allow a performer to program two other ten-minute or four five-minute works.

I discovered that this goal was more difficult than I had originally thought. I have learned in my own particular approach to composition that four movements of roughly the same

length run the risk of sounding too similar to one another. This problem became clear to me when I realized that the form of the third movement was too similar to what I had sketched for my second movement. Setting time values to movements before even writing them had severely limited my compositional options. I tend to use certain formal patterns as skeletons when filling certain time slots and tempos. After my initial sketches for various movements were complete, I found that my focus on exploring different timbres and compositional techniques was at the cost of giving special attention to formal development. I had written down ideas on forms for individual movements, but my fleshed-out sketches were closer in nature to structures I typically rely on. Writing four minutes of slow music is fundamentally different from writing four minutes of fast music. By definition, more fast-paced music has to be written to fill the same amount of time as slow-paced music. Therefore, halfway through sketching "Pollux" I decided to change the large-scale formal structure of *Musica Universalis* to help each movement be unique.

In its final form, *Musica Universalis* is loosely structured as a palindrome. Although the work still has four movements, the inner two, longer movements are now flanked by a shorter prelude and postlude of three to four minutes each, making the entire performance duration approximately twenty minutes. "Hamal" and "Aldeberan" are high energy, fast movements; "Pollux" and "Antares" are lower energy, slow movements.

Several prevalent themes, gestures, and techniques throughout the work create large-scale cohesion. Each movement uses pedal tones, drones, and ostinati as source material for the foreground and background. Arpeggios, quintal harmony, gestures built around thirds, contrasting unisons/octaves with thick clusters, and planing are also common tools I use to

develop or harmonize compositional germs. I also frequently use high tones and harmonics to paint high spaces and suggest distance. The harmonics are typically performed as the aforementioned pedal tones and define entire sections of movements.

Because it is the prequel movement, "Hamal" introduces material that is later repurposed in each subsequent movement. "Antares" serves as a contrast by using material that only appears in "Hamal" and is the most thematically and formally unique movement of the set. These two movements also serve as loose opposites of each other; "Hamal" has the most internal sections in the movement, and "Antares" is more fluid and continuous in nature. Each section in "Hamal" is noticeably shorter than sections in subsequent movements. Meanwhile, "Antares" is more amorphous and does not contain any clearly defined sections. Lastly, "Hamal" uses repetition as the primary means of reinforcing sectional material, whereas "Antares" is the only movement to rely on gradual development rather than brief canonic exercises.

"Aldeberan" and "Pollux" frequently quote each other, using main compositional ideas of one movement as background material in the other one. These two movements also have the same structure: a modified, large-scale, balanced binary form. The first sections of both of them are also faster than the second sections; this gives both movements a relatively fast-slow-fast structure when the ending material of the first section returns.

CHAPTER 6: Hamal

When I started sketching ideas for *Musica Universalis*, I initially wanted to write four movements that could be performed individually. I was thinking pragmatically; composing four movements where each one was interesting enough to warrant being performed individually in a conference would give me several outlets to have the written material performed. As *Musica Universalis* evolved, however, I found it impractical to meet this goal.

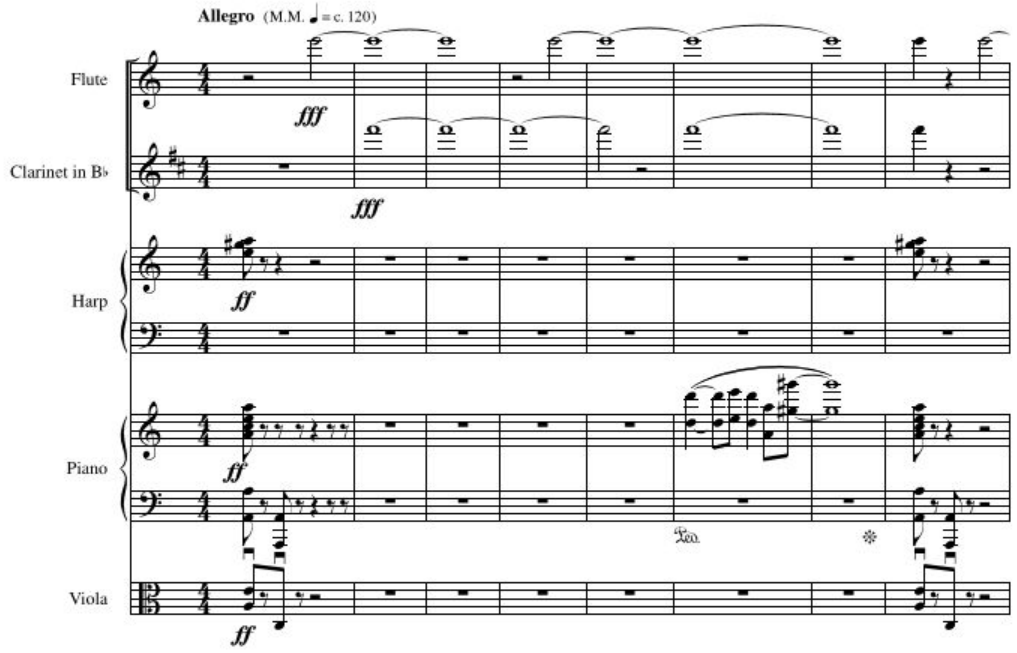
In order to create four smaller works that I could present at conferences, I decided that each movement would have to be roughly the same length, and additionally be formally interesting enough to stand on its own merit while also fitting into a larger narrative. While sketching "Aldeberan," I wanted to devote even more time to it. This meant sacrifices needed to be made to other movements. I had written cursory notes about each movement before drafting the entire work, and although "Hamal" is the first movement chronologically of *Musica Universalis*, it is one of the last movements that I composed. "Aldeberan's" rough draft was finished and "Pollux" was roughly sketched before I even began writing musical ideas for "Hamal."

I was very happy with "Aldeberan" and "Pollux"; both movements felt solidly sketched out and accurately reflected all of my notes and compositional goals. However, both were also similar in formal development and length. In order to prevent each movement from becoming monotonous, I re-evaluated my compositional goals and decided to change the large-scale form

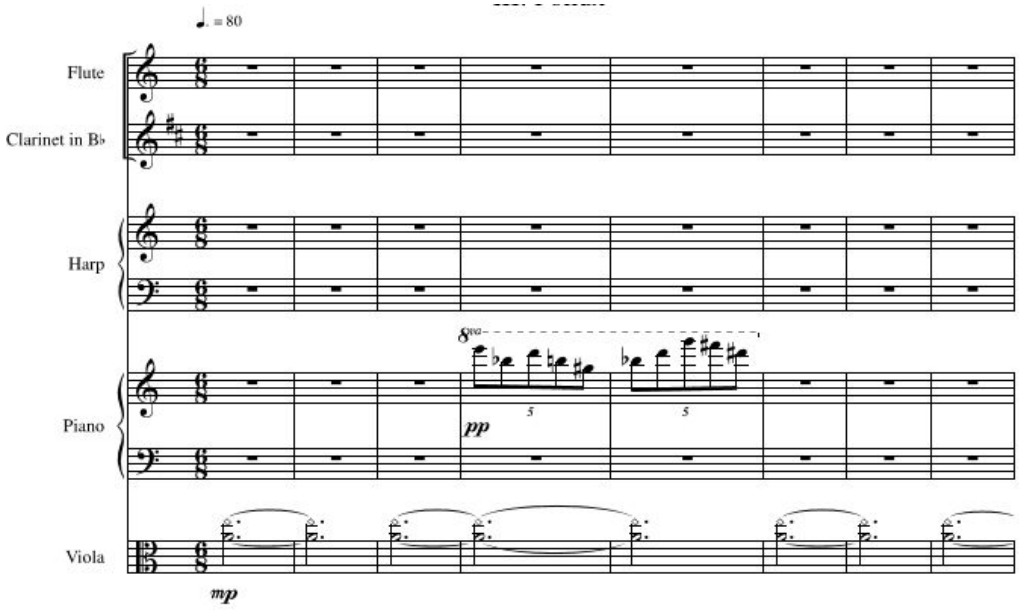
of the work. In doing so, “Hamal” became a prequel movement. It has deviated the farthest from my original sketches and changed the most over the course of composing *Musica Universalis*.

Hamal is one of the brightest stars in the night sky, and it is also part of Aries, which is considered one of the more energetic astrological signs. Individuals born under Aries tend to be typecast as those who act first and think later. I therefore decided that “Hamal” should be an energetic movement to reflect these extramusical ideas. Just as Aries is depicted as the first sign in the zodiac calendar, Hamal is the first movement of the work. I originally planned Hamal to consist of a collection of short ideas that rapidly switched back and forth without developing. Once my large-scale plan changed, I took the original idea and modified it to change “Hamal” into a prelude/overture. It is still non-developmental, but now it introduces material that is later used in “Pollux” and “Aldeberan." The movement also introduces techniques used throughout the entire work. For example, repeated notes and pedal tones–something aggressively present in “Hamal"–recur in each successive movement.

Compare Example 6.1 to Example 6.2. The former shows the opening measure of “Hamal.” A short, two-chord gesture is followed by the flute and clarinet sustaining a fortississimo E6. The E6 is cut off by the return of the opening gesture in measure 8. Example 6.2, the beginning of “Pollux," takes this idea and modifies it. The dynamic is now pianissimo, and it is played as a harmonic by the viola, which reduces the volume and makes the E6 less present. The E6 shown in Example 6.2 is much longer than the E6 in Example 6.1 due to the slower tempo. Additionally, the violist does not use breath to produce tone and can therefore sustain pitches for a longer duration.



Example 6.1: **“**Hamal," m. 1 – 8



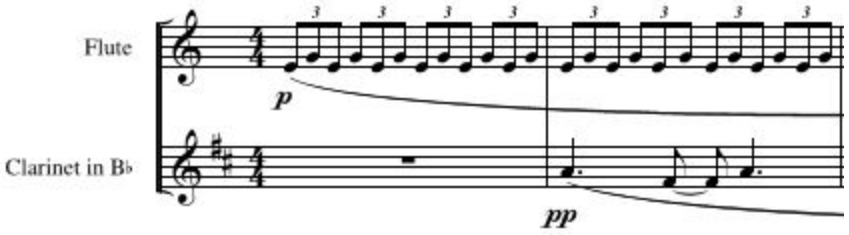
Example 6.2: “Pollux," m. 1 – 8

FORM FOR HAMAL	
Section	Measure Range
A	1 – 15
B	16 – 27
C	28 – 37
A’	38 – 45
B’	46 – 60
D	61 – 88

Table 1: Form for “Hamal”

“Hamal” has a form of ABCA’B’D. There is not much development in any section. The opening A and B sections repeat material in order to extend their durations. For example, measures 9 – 14 are a direct repetition of measures 1 – 7 but with additional instruments and added gestures. While the entire work introduces material later repurposed in successive movements, the materials from sections A, B, and D are the most prominently exploited. For example, the main motive in section A is later repurposed into background material in “Pollux." In Example 6.3a and 6.3b, the chorale of the B section is built around a minor 3rd, which later returns as the driving ostinato for “Aldeberan." Lastly, the cascading soundscape of section D is later used as the compositional focus for “Antares." It is the only slow and low-energy section of “Hamal."

Example 6.3a: Chorale from “Hamal," m. 16 – 19 (flute and Bb clarinet, upper stem; viola, lower stem)



Example 6.3b: **“**Aldeberan," m. 1 – 2 (flute and Bb clarinet)

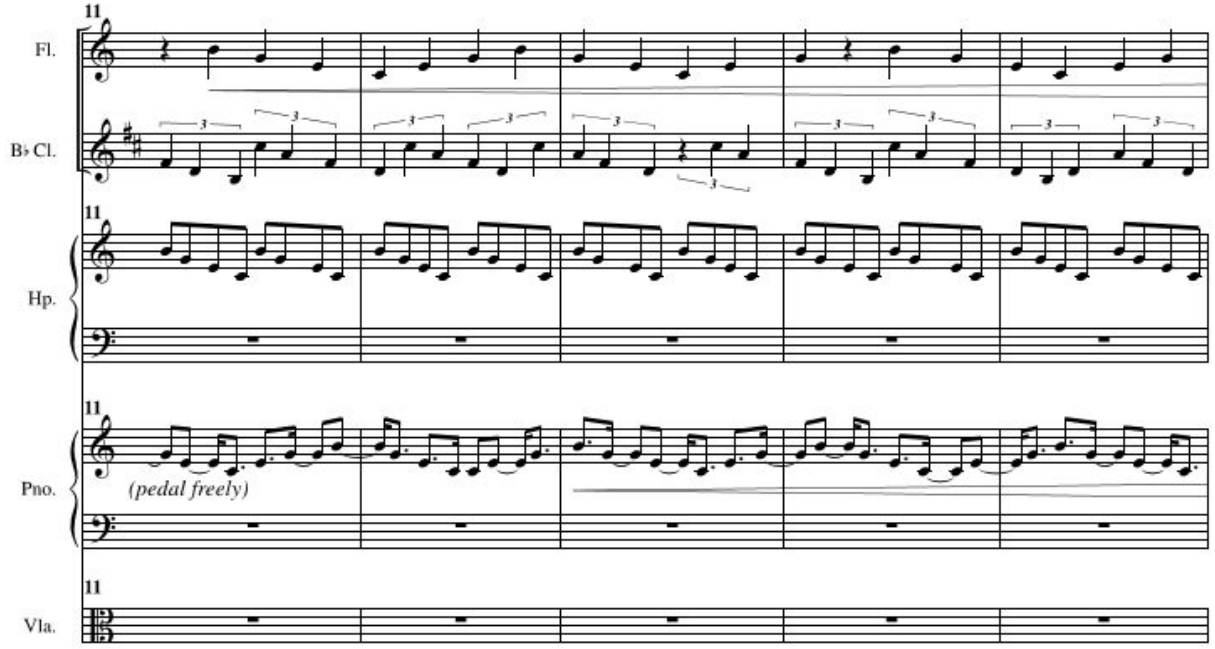
Material throughout “Hamal” is repeated rather than developed. Instead of shifting tonal centers, ideas tend to repeat or fragment, and the density increases by adding layers of slightly new material. For example, measures 9 – 14 of “Hamal” contain the exact same material as the opening measures. The only difference is the addition of instruments to thicken the texture. The piano performs the melody both times, the flute still performs the E6, and it sounds before the Bb clarinet moves to D#6 for added color. In measures 9 – 11, the harp and viola continually exchange notes for timbral effect.

Formally, section C is the only part of the movement not built out of material that is later recycled. In it I use a technique that frequently appears in later movements, however. Harmony results from canonic procedures rather than from more traditional harmonization of melodic

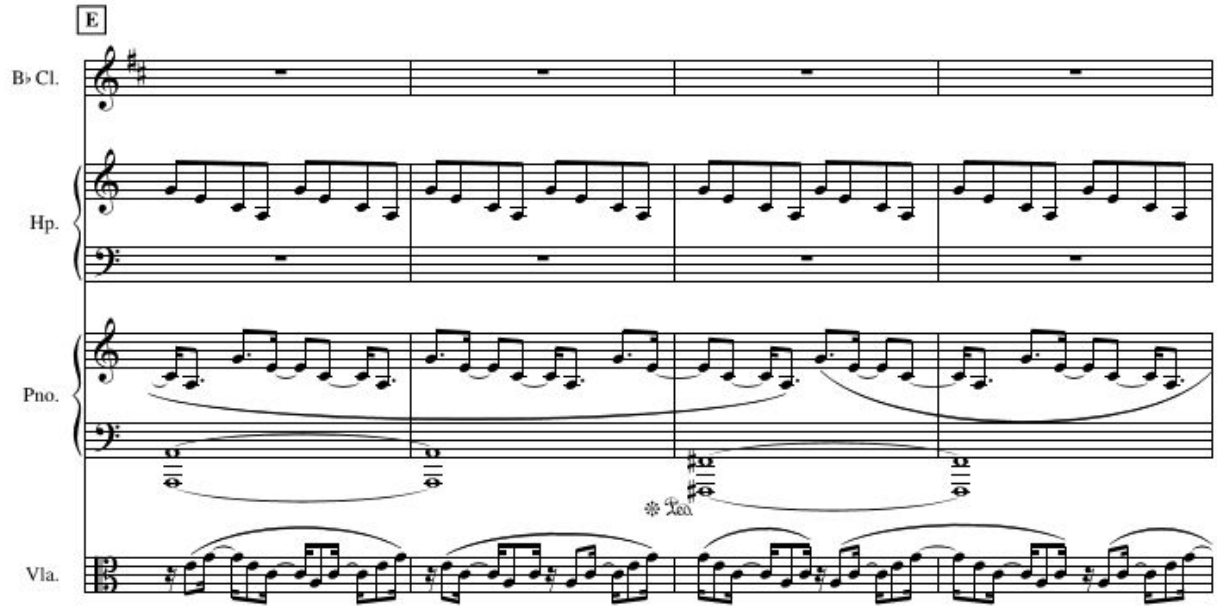
material. In measure 33, for example, the flute, clarinet, and viola are all playing octaves apart and one beat behind the piano and harp. By measure 37, the idea has been fragmented and repeated at faster note values. This specific technique is later found in important sections of "Aldeberan." Canon and micropolyphony are used as primary sources of harmony in all three subsequent movements.

While the other sections were built from the existing materials I had created for "Pollux" and "Aldeberan," I sketched ideas for "Antares" after deciding on the changes for "Hamal." Because of this, section D of "Hamal" is the only one written with the intention of being reused rather than coming from earlier material. Its similarity to later material is consequently the strongest. The texture is almost exactly as is found in "Antares:" the instruments serve similar functions, the dynamics are the same, and the pitch range is roughly the same. However, the section has a "melody" in the bass line not found in "Antares," and it changes pitch at a much faster rate than material later found in "Antares."

Compare Example 6.4a and 6.4b. The former is the opening material from "Antares." The flute, clarinet, harp, and piano all perform a CMM7 chord. There is no unique melodic line present in the material. The music is entirely textural in nature. The latter is taken from section D of "Hamal." The texture is completely identical to that found in 6.4a**.** There are only two major differences between the two examples. The first is that the pianist in 6.4b performs a melody in the left hand. The second difference is that the viola, piano, and harp play an arpeggiated Am7 in 6.4b instead of the CMM7 played in 6.4a.



6.4a: “Antares," m. 11 – 15



6.4b: “Hamal," m. 68 – 71

CHAPTER 7: Aldeberan

"Aldeberan" is the second movement of *Musica Universalis* performed, but was the first one sketched out. Because of this, "Aldeberan" is closest in spirit to what I originally planned for each of the movements. It is one of the longer movements, is capable of being performed as an independant movement at a conference, and is between six and seven minutes.

The primary reason I began composing "Aldeberan" first is that the compositional approach for the movement was the easiest one for me to write. I was heavily inspired by attributes that people associate with Taurus. The star Aldeberan has some mythology surrounding it in addition to being a part of Taurus. While I didn't find this particular material useful in constructing musical parallels, I found a wealth of inspiration from the greater Taurus constellation.

Taurus is the second sign in the astrological calendar and immediately follows Aries. It is associated with loyalty, steadfastness, predictability, and stubbornness. I immediately associate these adjectives with unchanging, highly repetitive ostinati. I thus decided to construct a movement organized around the interaction of various ostinati layered in different combinations. The original plan was to create a slowly morphing, fluid movement that gave the illusion of little change; I wanted to recreate the psychological effect of not realizing the music has changed until two to three minutes past the change. Ultimately, creating this particular effect is very difficult, and the movement is formally simpler than I had originally intended.

FORM FOR ALDEBERAN		
Section	Subsection	Measure Range
A	a^1	1 – 48
	a^2	49 – 77
Transition Material		78 – 95
B		96 – 156
A	a^1	157 – 171

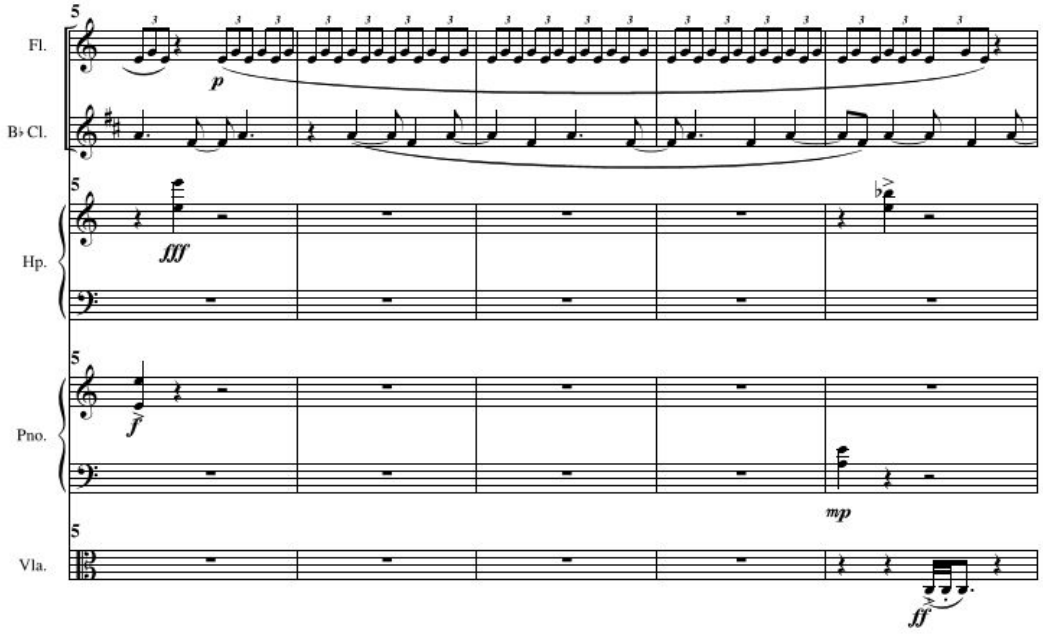
Table 2: Form for Aldeberan

The work divides into two large sections that are organized around different treatments of the individual ostinati. It is also a large-scale, somewhat balanced, binary form. For purposes of this chapter, I am formally labeling the work $a^1a^2Ba^1$. Section A is divided into two smaller subsections. Subsection a^1 is driven by an oscillating minor third in the Bb clarinet and flute. Section B features a descending chordal pattern in the piano.

The movement itself is not tonal but uses some tonal clues to create motion and to separate the larger sections. Section A is pan-diatonic and uses predominantly tertian-based chords. Section B uses quintal-based chords as the driving harmonic force.

Because "Aldeberan" immediately follows "Hamal" with as short a break as possible, section a^1 begins with an elongated CMm7. This chord gives the impression that the music is continuing from earlier material. This music also begins on the same pitch on which "Hamal" ends; the last sounding note of "Hamal" is an E4 in the harp, and the starting notes in the Bb clarinet's ostinato are E4 and G4. Example 7.1 is taken from subsection a^1 and shows how "Aldeberan" and "Hamal" are related. In this example, the clarinet and flute play the opening

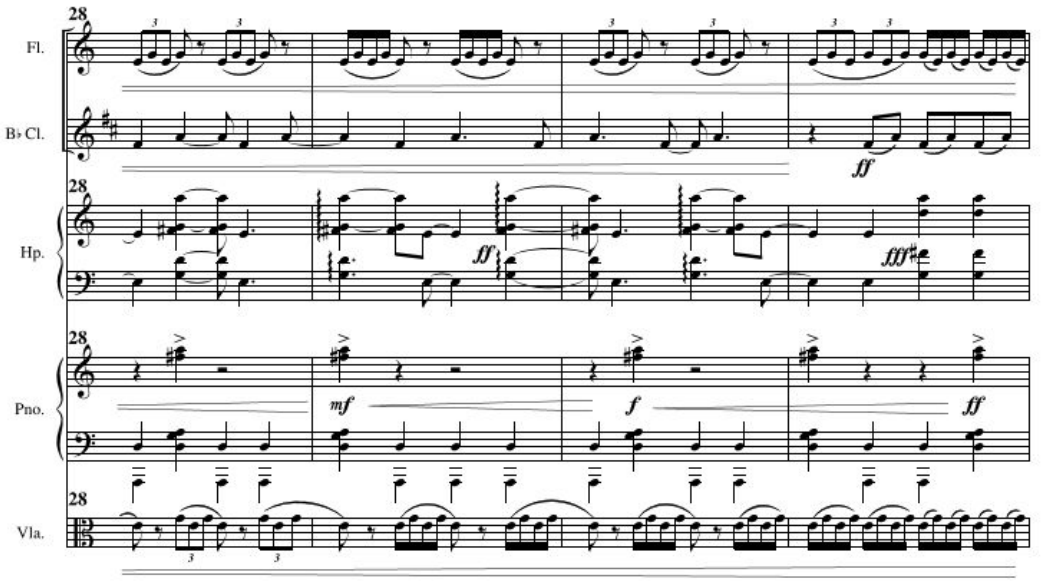
ostinato at different tempos. From measures 5 to 9, the viola, piano, and harp spell out what sounds like a Major minor 7 chord with an added A3 in the bass of the piano. Suspension is also used in the introduction of "Hamal." Both movements contrast static, extended ideas with brief sections of activity in the other instruments. While the viola, harp, and piano perform at different times, they deliberately spell out the Mm7 chord. This use of tertian harmony is also present at the beginning of "Hamal." It is also worth noting that both movements use E in the static material. "Hamal" begins with the flute and clarinet performing a suspended E6; "Aldeberan" begins with E4 as one of the two notes used in the ostinati.



Example 7.1: "Aldeberan," m. 5 – 9

Measures 10 to 20 continue building up the C7 chord through repetition. This technique is an exact replication of the opening measures of "Hamal." Measures 21 through 34 end subsection a[1] with multiple, layered ostinati. In Example 7.2**,** the clarinet continues the same

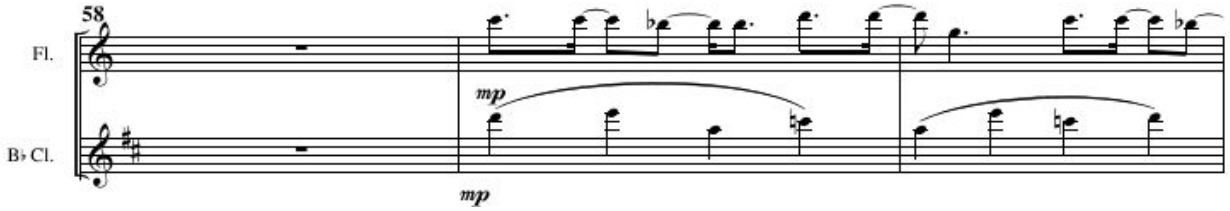
ostinato from the start of the movement. The flute and viola now perform a sped-up oscillation of the two pitches in duet with each other. Meanwhile, the harp performs a different, two-part ostinato. The first part is a chord with the pitches G, D, F#, and A; the second part is a solo E4. The piano plays yet another another two-part ostinato at a different speed. Its first part is a chord with the same pitches as the harp's first part but voiced differently. The second figure is a dyad of A1 and D3. The note durations are also shorter than in the harp, and the second chord repeats at varying durations.



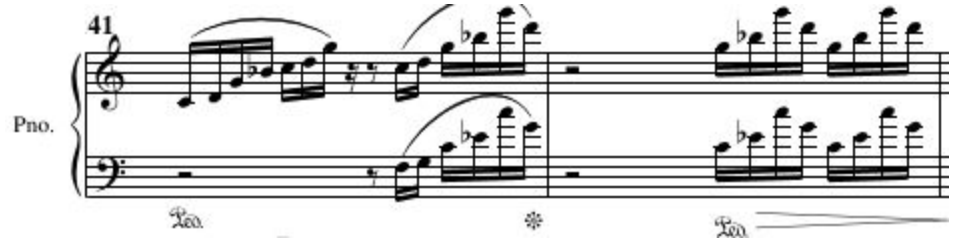
Example 7.2: "Aldeberan," m. 28 – 31

Subsection a^2 is built from an (0247) set, which appears in various transpositions, but is typically organized around pitches C, D, G, and Bb. Harmony is created by playing the set at various speeds on top of each other and/or transposing the set. For instance, Example 7.3a shows the Bb clarinet and flute playing the set at different speeds with each other. In Example 7.3b, the piano plays two transpositions of the set at the same time. The right hand performs

using pitches C, D, G, and Bb; the left hand performs the set using F, G, Eb, and C. The primary ostinato of subsection a[1] is still present in these measures. The viola, clarinet, and piano take turns performing it.

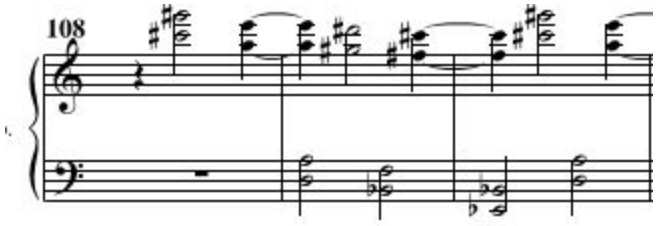


Example 7.3a: **“**Aldeberan," m. 58 – 60 (Flute and Bb Clarinet)



Example 7.3b: **“**Aldeberan," m. 41 – 42 (Piano)

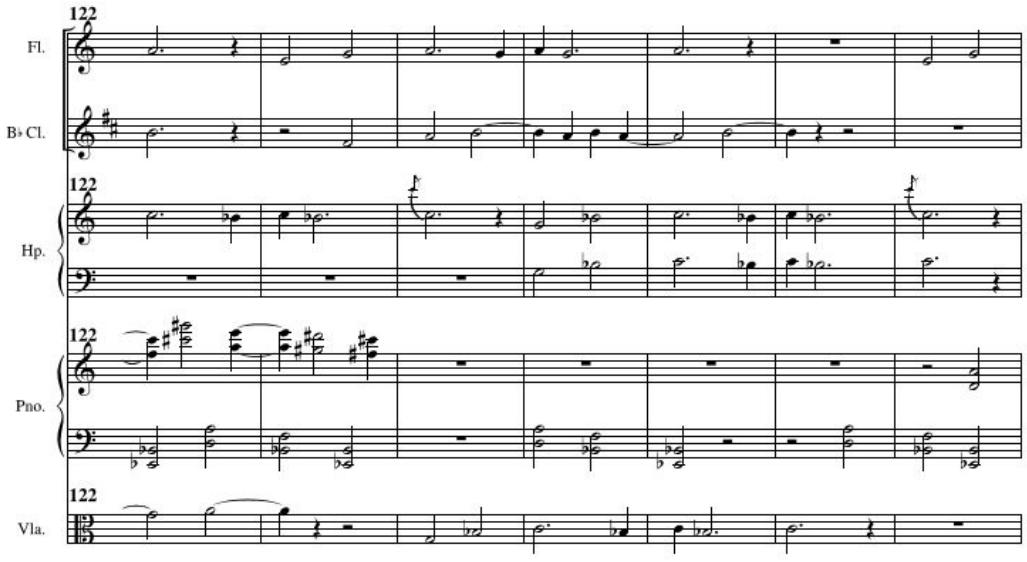
Section B continues using ostinati as the driving force, but it is markedly different from earlier material. The primary reason I divide A into two subsections rather than labeling the work ABCB is the contrast in material from B to the rest of the work. The B section is organized around a cascading series of quintal dyads. Throughout this section, the piano performs these quintal dyads individually in each hand. At times, such as in Example 7.4, one hand plays a longer series than the other hand. In other measures, the piano plays a series of three quintal dyads in each hand, but changes dyads at different times.



Example 7.4: “Aldeberan," m. 108 – 110 (piano)

The other main compositional germ of the section is a canon between the viola, flute, clarinet, and harp. This canon melody, found in Example 7.5, plays repeatedly alongside the piano’s cascading dyads. This melody can be transposed or played at different lengths in a manner similar to the techniques used in Examples 7.3a and b. The melody of Example 7.5 and its transpositions are also inspired by the ostinati in section A. It begins with a minor third, the interval used in subsection a^1, and ends with a series of major 2nds, the interval used for the viola’s ostinato in subsection a^2. When performed as a transposed canon, the two lines begin on E4 and G4/G3, the two specific pitches of subsection a^1’s ostinato.

Example 7.5: Melody of “Aldeberan," section B



Example 7.6: “Aldeberan," m. 122 – 128

Example 7.6 contains all of the elements discussed in section B. From measure 122 to 123, the piano plays a series of dyads displaced by a quarter note. The left hand continues performing a series of three half-note dyads from 125 to 128. In measure 123 the flute and clarinet start performing the melody of Example 7.5 in canon. The clarinet is displaced a half note. Both instruments begin on E4. In measure 124, the viola starts another line of the canon but beginning on G3. In measure 125 the harp joins the canon G3 and G4.

The return of subsection a^1 is verbatim but with added Bbs in the harp. The movement ends in the middle of a loud crescendo in which each voice is active. It is written this way to allow a transition into the next movement, which begins quietly.

CHAPTER 8: Pollux

"Pollux" is the third movement of *Music Universalis*, but chronologically the second movement I composed. I began sketching it after finishing the rough draft of "Aldeberan." Like "Aldeberan," “Pollux” is very close in spirit to my original goals for *Musica Universalis*. As I finished writing the movement, however, I realized how similar its form was to "Aldeberan." This prompted me to make some changes and assess two things: how would the works be different from each other, and what would make “Pollux” unique in the piece.

"Pollux" is the longest movement in the cycle. Like "Aldeberan," it contains enough material, is long enough in duration, and develops its material enough to be an independent work I would be comfortable presenting at conferences. It is also the slowest movement. Over the course of the piece, the tempo slows a bit from a pulse of 80 to 76 bpm.

The primary element separating Pollux from other selected stars is the narrative properties of the star itself. The constellation Gemini derives its name from the mythological twins Pollux and Castor. Both twins were Argonauts who were also technically half-brothers. They shared the same mother, Leda, but Pollux was the son of Zeus. According to mythology, Zeus visited Leda as a swan and raped her.

The narrative history and literal meaning of Gemini helped me form the plan for writing this movement. Because the symbol for Gemini is a pair of twins, I wanted the work to have two

separate sections, where each one would depict a scene from Pollux's life. Neither scene is directly inspired by myths surrounding the Grecian hero.

For the first section, I wanted to use the myth surrounding the birth of Perseus instead of Pollux. I prefer portraying the myth of Perseus' conception for two reasons: one, the depiction of light fits with the larger focus on stars and constellations, and two, the music would be less graphic in nature. Specifically, the two heroes share the same divine father, but have different mothers and methods of conception. Rather than having intimate relations with a bird, Perseus' mother, Danaë, was visited by a shower of golden light.

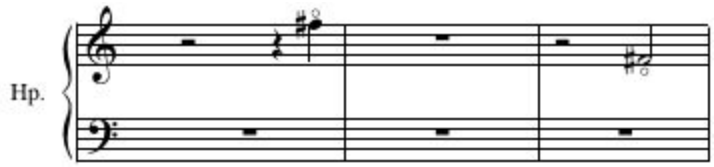
For the second scene, I originally intended to write swashbuckling music evocative of Pollux's history as an Argonaut. As I composed "Pollux," I started writing transitional material to move from the first large section into the second. I eventually liked this material so much that I decided to use it as the entire second section of the movement. This decision ultimately made "Pollux" less programmatic than first planned, but also helps solidify "Pollux's" musical identity as the slow movement within the greater musical structure of *Musica Universalis*. "Pollux" is now the slowest movement and has the most advanced tertian-based harmony within *Musica Universalis*. Both large sections also take material introduced by "Hamal" and develop it independently using non-modal scales.

FORM FOR POLLUX		
Section	Subsection	Measure Range
A	a^1	1 – 74
	a^2	75 – 119
Transition Material		120 – 124
B		125 – 172
A	a^1	173 – 198

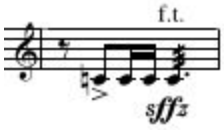
Table 3: Form for Pollux

"Pollux" has a formal structure of $a^1a^2Ba^1$. As mentioned in Chapter 7, this is the same form found in "Aldeberan." There are a few differences between “Aldeberan” and “Pollux." Generally speaking, the sectional changes in “Pollux” are more gradual than in "Aldeberan," which is defined by the slow change and layering of ostinati; "Pollux" features lengthier transition times and more programmatic music. Additionally, “Pollux” contains a large section of transitional material quoting "Aldeberan" from measures 96 to 113. Lastly, the return of a^1 at the end of “Pollux” is a quotation of opening material rather than the direct repetition of material found in the end of "Aldeberan."

Another important feature of this movement is my employment of sound effects to differentiate the movement from others. As seen in Examples 8.1a–d, the work uses different performance techniques for the piano, Bb clarinet, harp, and viola. In Examples 8.1a and c, harmonics are used for color in both the viola and harp. In Example 8.1b, flutter tongue is used in the clarinet, and in Example 8.1d the pianist is instructed to pluck strings inside the piano.

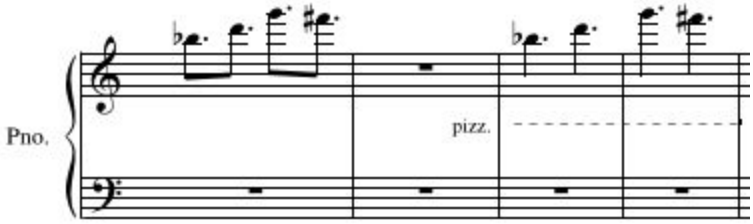


Example 8.1a: "Pollux," m. 103 – 105 (harp part)



Example 8.1b: "Pollux," m. 28 (Bb clarinet part)

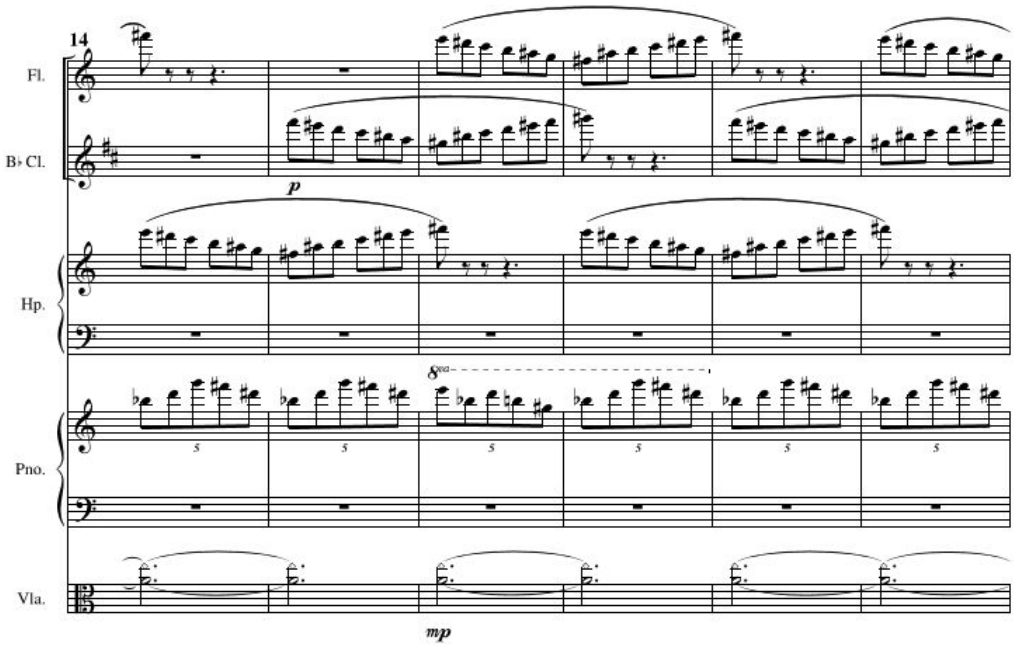
Example 8.1c "Pollux," m. 1 – 5 (viola part)



Example 8.1d: "Pollux," m. 20 – 23 (piano part)

In order to musically paint the shower of light in section A, "Pollux" uses harmonics, circular gestures, canon, upper registers, and polyrhythmic textures. I also decided to use non-modal scales and gestures that do not imply any tonal center in order to separate the movement from the rest of the work and give it an alien, otherworldly feeling. Example 8.2 is an example of these techniques happening simultaneously. In measures 14 through 19, the harp,

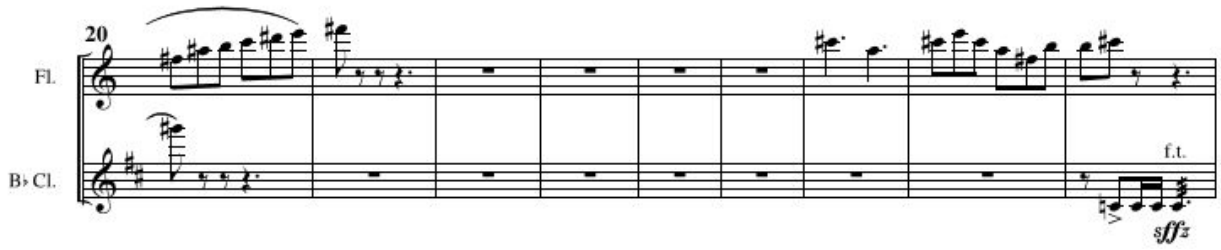
clarinet, and flute performing canon separated by one measure. The canon is a synthetic scale built from pitches: G, A#, B, C, D#, E, and F#. Underneath this, the viola performs a harmonic as a pedal note. During this time, the piano plays a two-measure long, quintuplet-based pattern using the pitches: E, F#, G, G#, Bb, B, D, and D#. This quintuplet pattern clashes rhythmically with the triplet-based canon in the woodwinds and harp.



Example 8.2: "Pollux," m. 14 – 19

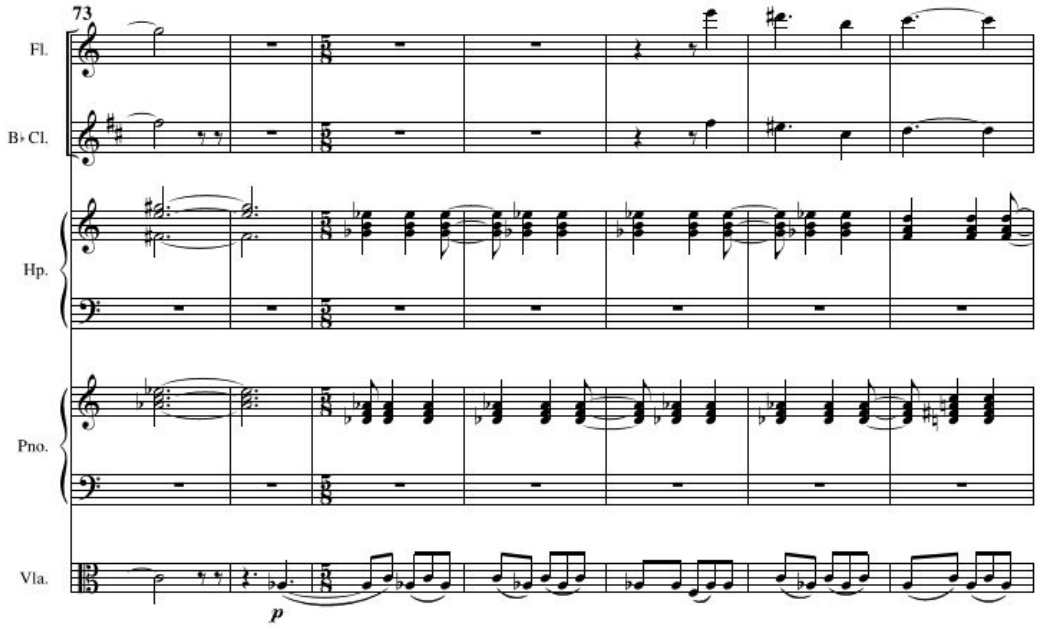
Section A has a singsong-like melody and is supposed to evoke a potential lullaby. It is occasionally interrupted by flutter-tongue sections in the clarinet. These flutter-tongue gestures are meant to evoke the honking of a goose. The clarinet's interruptions are a tritone away from the pedal tone and are markedly louder than the rest of the music being performed. I inject this clarinet line in order to evoke the original myth of Pollux's inception that was replaced with

Perseus'. In Example 8.3, the melody and flutter-tongue passage happen simultaneously. The flute part in measures 28 to 30 contains the main theme of section A, and the clarinet performs the flutter-tongue interruption in measure 30.



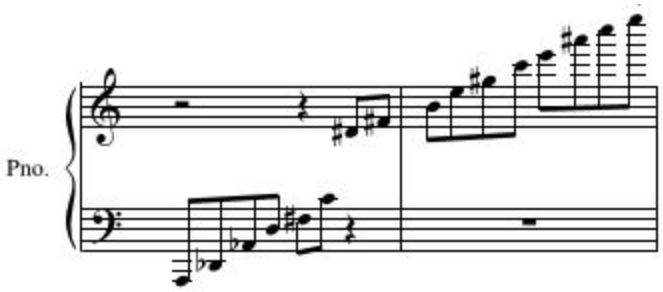
Example 8.3: "Pollux," m. 20 – 30 (flute and Bb clarinet part)

Subsection a^2 recycles material from "Aldeberan" and is more polytonal in nature. While subsection a^1 uses synthetic scales organized around an E pedal tone, subsection a^2 uses a pulsating chord sequence in the harp and piano. In Example 8.4 the harp and piano perform clashing Cb6 major (written as Gb, B, and Eb) and Db major chords oscillating an eighth note apart. Underneath this, the viola performs an ostinato using A3b and C4. In measures 77 – 78, the viola line changes to quote the beginning of the melody found in Example 8.3.



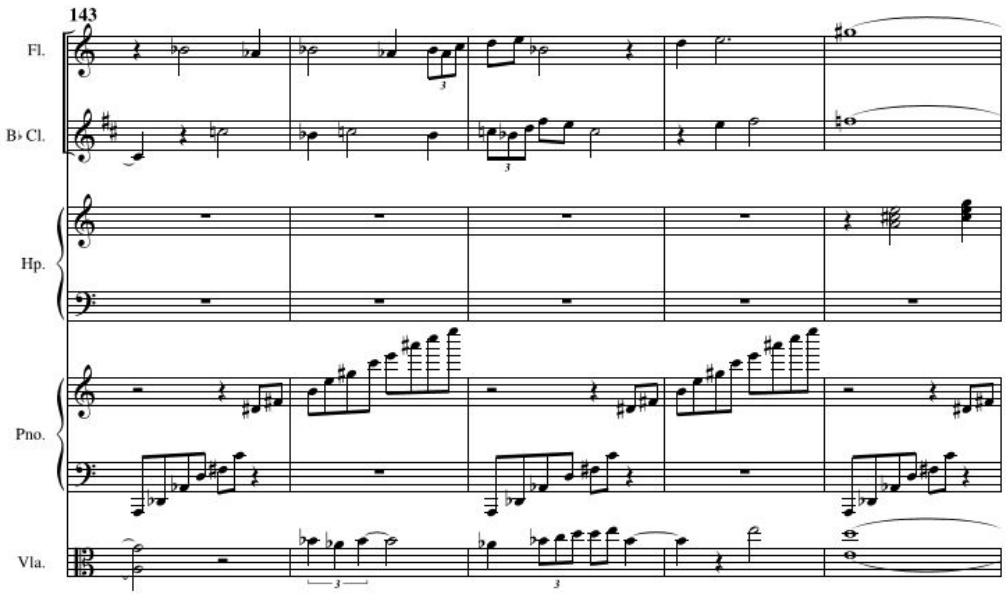
Example 8.4: "Pollux," m. 73 – 79

Section B has four major characteristics that separate it from section A. Whereas section A was written with narrative material in mind, section B evolved out of sketches of transitional music. Section B, like section A, is not tonal. However, no particular tone is tonicized via droning. Section B instead has a repeating pattern in the piano. This pattern is metrically modified throughout the section by occasionally removing or repeating various 8th notes. Example 8.5 is a notation of this pattern found in the piano.



Example 8.5: "Pollux," m. 125 – 126 (piano part)

During this section, the viola, flute, and clarinet either play in canon with each other or sustain non-tertian chords in a voicing evocative of the chorale found in "Hamal." The harp planes root-position tonic triads, using pitches not present in the other instruments. In Example 8.6, all of these elements simultaneously happen. In measures 143 – 146, the flute, clarinet, and viola play in canon over the repeating piano progression. In 147, the three instruments sustain a non-tertian chord while the harp begins arpeggiating tertian chords.



Example 8.6: "Pollux," m. 143 – 147

After the climax of the work in section B, the opening of the movement is briefly quoted. Most of the orchestration combinations used in the opening return as well: Harmonics are used in the viola and harp, and the piano uses plucked strings. E is used as a drone throughout the

quotation as well, and is the only tone present at the double bar line. The ending of "Pollux" is as quiet as its beginning and thus gives the impression of being timeless.

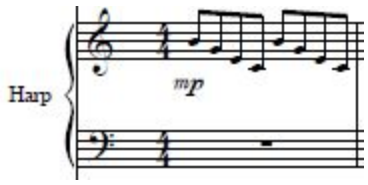
CHAPTER 9: Antares

“Antares” is the last movement of *Musica Universalis*. I began sketching it while writing "Hamal," but by the time I started composing the movement, my overall plan for *Musica Universalis* had changed. I began thinking of "Antares" as a musical postlude. The movement somewhat mirrors "Hamal." Like "Hamal," "Antares" is a shorter movement and designed to need at least one other movement performed with it to work in a concert/conference presentation. However, the movement is the most distinctive movement of the four in terms of form and harmonic progression. Additionally, it has a harmonic language not really present anywhere else in the work.

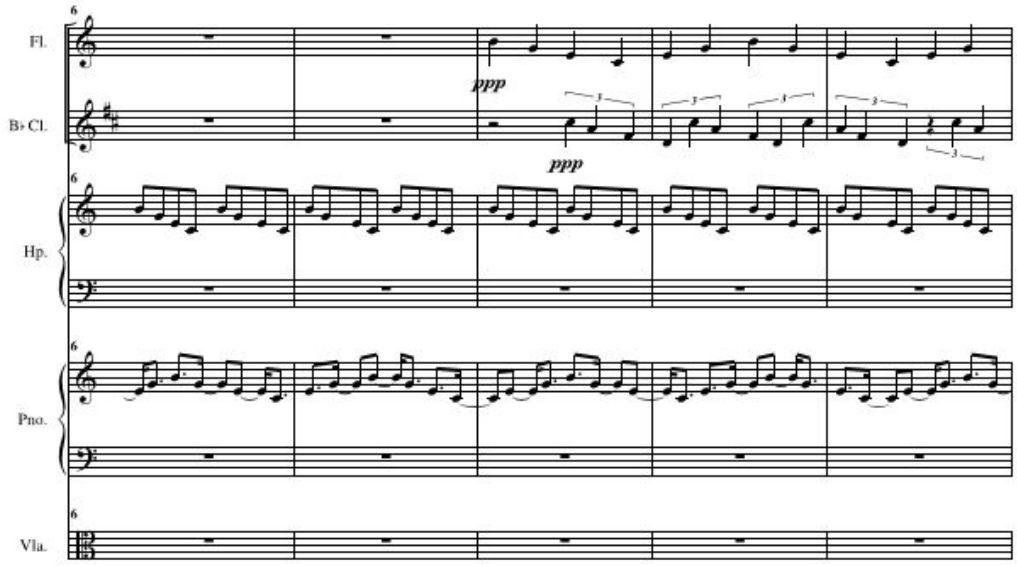
"Antares" is the brightest star in Scorpio. The literal meaning of Antares is “opposite of Ares." This name comes from Antares’ reddish color, similar to Mars (the Roman equivalent of Ares). In astrology, Scorpio is considered one of the most mysterious stars. It is depicted as an emotional yet secretive sign. When sketching the properties for the movement, I wanted to take the literal meaning of the name and general properties of Scorpio and transform them into musical ideas. I envisioned writing music literally the opposite of what I would write for “Ares." Instead of aggressive, warmongering, and militaristic music, “Antares” is soft, gentle, with gradual changes, and is organized around the consonant MM7 chord. To capture the mysteriousness I associate with Scorpio, the movement is timbral and amorphous.

"Antares" is also a work without discrete sections. While it can be divided into two sections, I wrote the movement's structure as a giant exercise in tension and release. For the first three minutes it expresses a slowly drawn-out increase in tension up to the climax. After this, the work relaxes until only one instrument is performing. Tension is created throughout the movement in both rhythm and harmony.

The compositional germ for this movement is an arpeggiated MM7. The harp performs an arpeggiated CMM7 chord throughout the majority of the movement. Example 9.1 is a sample of this chord**.** The other instruments begin performing the CMM7 chord at different tempi and create harmony by the combination of notes being heard at any given moment. In Example 9.2, the harp, piano, flute, and clarinet all perform a CMM7 chords at different tempos. The harp continues to perform a descending arpeggiated line with each note lasting an eighth note. In measure 8, the clarinet performs this same pattern as quarter-note triplets. The piano and flute perform arpeggiations that both ascend and descend. The rhythmic value for the piano's arpeggiations is dotted eighth notes; the flute performs its arpeggiations as quarter notes.

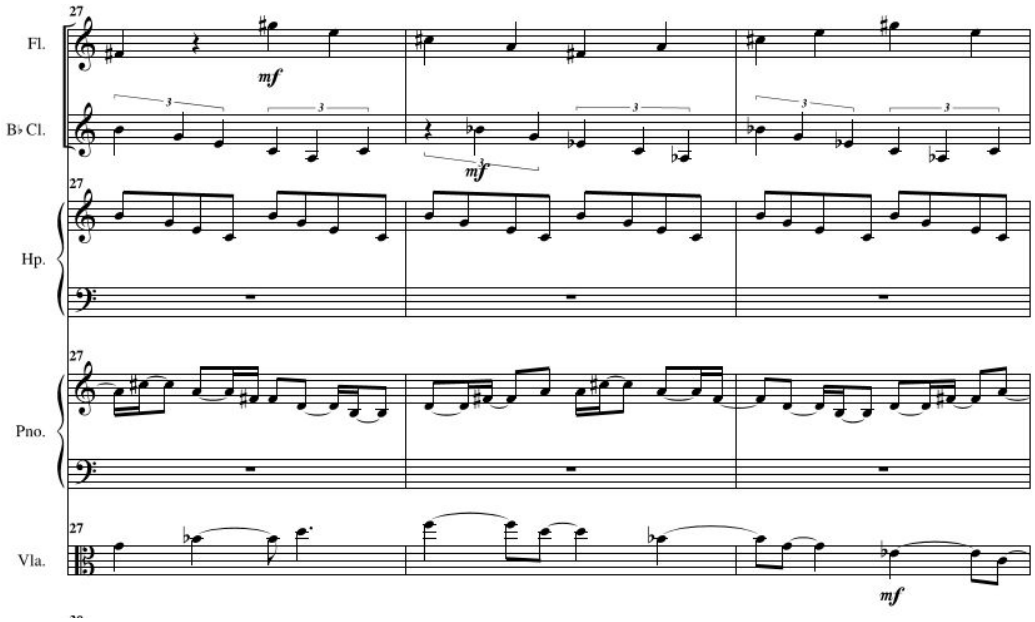


Example 9.1: Harp Motive from "Antares"



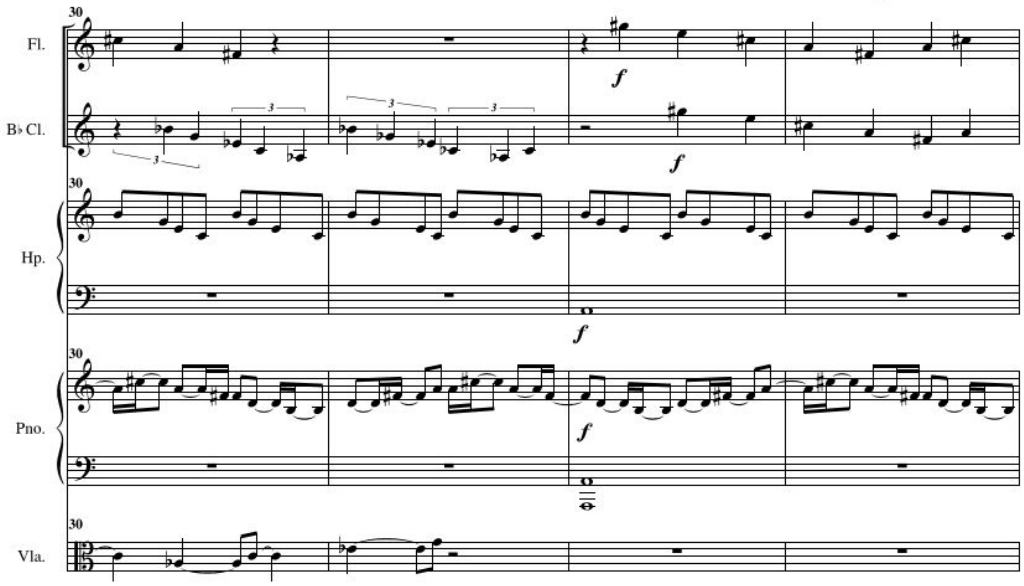
Example 9.2: “Antares," m. 6 – 10

As the movement progresses, each instrument enters, performing its MM7 with different note durations. By the midpoint of the movement, each instrument is performing a series of thirds in a different key and at a different pace. In Example 9.3, the following happens: The harp continues performing the CMM7 ostinato; the flute performs G#, E, C#, A, and F# as quarter notes; the clarinet performs Bb, G, Eb, C, and Ab as quarter-note triplets, the piano performs B, D, F#, A, and C# as dotted eighth notes; and the viola performs F, D, Bb, G, Eb, and C as dotted quarter notes.



Example 9.3: “Antares," m. 27 – 29 (clarinet in concert pitch)

After the movement’s climax, the introductory material reappears with only a few changes. Each instrument following the harp enters at pianissimo and only gradually crescendos until measure 32, which is the climax of the work. There, the flute, viola, and clarinet stop performing their passages. The piano performs a forte A3 and A2, and the flute and clarinet begin performing the same sequence of thirds as a canon. In Example 9.4, measure 32, a technique from earlier movements is reused; the viola, clarinet, and flute all perform the same sequence of thirds as quarter notes, dotted quarter notes, and half notes, respectively. The piano performs A3 and A2, pitches notably lower than the rest of the material, as a fortissimo whole note. The flute and clarinet begin performing their sequence of thirds at the same time, and the viola joins a beat later. However, the flute and clarinet are still performing the same G#5 when the viola joins the line.



Example 9.4: "Antares," m. 30 – 33 (clarinet in concert pitch)

The last thing I will stress is the fluidity of this movement compared to others. Whereas other movements use ostinati, to the point of it being the central focus of "Aldeberan," no other movement uses the same ostinato endlessly in the same instrument. Additionally, changes are slow and gradual. Each instrument typically enters the texture by performing material that another instrument is performing, before moving on to their own. Additionally, instruments are added and removed individually. With the exception of measures 44 – 54, no instrument enters or exits the texture at the same time. The movement also begins and ends with only one instrument performing. It is almost entirely textural in nature; no instrument performs a melody or fragment of a theme. The entire movement consists only of a continuous cascade of thirds at various speeds, with a simultaneous sustained A in various octaves.

CHAPTER 10: Conclusions and Future Directions

To briefly recap, *Musica Universalis* is a four-movement chamber work for flute, clarinet, harp, piano, and viola. The twenty minute composition draws inspiration from concepts found in astrology and myths associated with stars found in zodiac signs. Each movement of the work is named after a different star, and has a personality reflective of the unique traits associated with its zodiac sign. At the same time, it use similar musical material throughout the four movements to create a sense of unity. Hamal, inspired by Aries, is a prelude movement that lacks development and quickly moves from one gesture to the next. It also introduced material reused in all subsequent movements and is similar in spirit to a overture. Aldebaran takes inspiration from Taurus and uses a series of ostinati throughout the entire movement. Pollux, named after the grecian hero and brightest star in Gemini, is divided into two clear sections that are programmatic in nature. Antares presents material that I envision would be the "opposite of Ares." It is gentle and gradient in the presentation of its musical material.

The composition of *Musica Universalis* has been a rewarding and revealing experience, and I have come away with a better understanding of my own writing process. Creating a large work is a fundamentally different process than creating a short piece. My speciality has been, and continues to be, short art songs and choral works; so developing this particular skill set has been a useful experience. Furthermore, writing a large work built from smaller independent

movements is a more complex process than I originally expected it to be. Although my goal had morphed into something different from my original plan, I strongly feel that I pushed myself creatively and produced a work of which I am proud.

I am especially happy with my use of motives and texture to unify *Musica Universalis*. When I write a work, I typically draft approximately forty-five seconds to one minute of music. After sketching this material and analyzing it, I flesh out the rest of the piece using established musical material. This method proved to be especially useful when I wrote "Hamal": I was able to look at material written in later movements and repurpose it to serve as introductory material that is similar to an overture. This process also encouraged my decision to change my original large-scale structure for *Musica Universalis*. Writing two movements and analyzing their similarities provided the groundwork for my decision to shape the remaining music into elements that are fundamentally different from my original plan.

Musica Universalis fills a relatively empty niche in chamber music repertoire. It is my hope that this work will become a popular choice for flute, harp, and viola trios looking to perform with additional instruments. I also hope that its harmonic accessibility makes the work attractive to performers, which in turn will help establish the work in performed chamber repertoire. *Musica Universalis* is also an example of twenty-first-century programmatic instrumental music. All movements' musical decisions were influenced by extramusical ideas that I translated into musical figures. These inspirations range from the narrative structure of "Pollux" to the brusque, impetuous formal structure in "Hamal," to the serene, amorphous presentation in "Antares." This approach to writing programmatic music can serve as an

example for future composers looking for ideas on how to write contemporary programmatic music or methods to combine astrology mythos with musical gesture.

Musica Universalis is also a work that requires a conductor. Conceiving of the work in this way allowed me to write musical gestures with a more complex interplay between players. While this could be seen as detracting from the traditional approach to chamber music in which performers have the responsibility for coordinating the music in performance, adding a conductor allowed me to write musically demanding lines and explore thick textures like the ones found in "Antares." This decision also allows me to treat the ensemble as a chamber orchestra and play with ideas differently than in a traditional chamber work. An example of this is the sustained viola harmonic in the beginning of "Pollux." Adding a conductor made me more comfortable having the note be performed without a break by placing less pressure on the violist to count measures. This very lengthy sound is integral to the formal structure of the section and is used as the foundation for all other musical material.

If requested to work on a project of this scale again, my experiences writing *Musica Universalis* have taught me to consider approaching writing a large work of this scope differently. I more or less imposed a time limit to compose *Musica Universalis*. This was done as a personal challenge; I wanted to simulate the timeframe that I expect to have when writing a large piece in a tenure-track faculty position. Simply put: I think my allotted time was much too short for the scope of the project. If I attempted to write a project of this scope again, I would either give myself more time to compose the work, or I would simplify some of the formal goals. Dedicating a larger amount of time for sketching the overall flow of the work is another change I would make. When I noticed that "Aldeberan" and "Pollux" had similar forms, I realized how

important taking time during the precomposition process is in order to determine how the two movements would differ from each other.

The last thing that I would change is that I would dedicate a much larger amount of time to studying literature. Writing the review of music literature and analysis of sampled contemporary works chapters has been a truly joyful process for me and has enriched my musical vocabulary. I began creating my detailed analysis of Adams' *The Wind in High Places* after composing half of *Musica Universalis*, and doing this so late in the composition process is a regret. *The Wind in High Places* gave me ideas for orchestration and made me want to experiment with some of the formal structures that Adams uses in the individual movements. If I had studied the work earlier, I suspect the individual forms of each movement in *Musica Universalis* would be more varied and distinctive. This lesson will affect how I approach future projects, and is ultimately something that has made me better as a composer.

Creating instrumental, programmatic music was another rewarding challenge. I am no stranger to writing programmatic music, but I typically rely on text to fuel my imagination. My instrumental music tends to be absolute in nature, and *Musica Universalis* allowed me to explore writing programmatic music from a source other than written text; I was able to explore translating myths and non-musical concepts into forms, gestures, motives, and instrumental combinations. These experiments also manifested themselves in different ways. The opening section of "Pollux" uses timbre and melody to evoke a common myth. The form of "Hamal" and non-developmental approach are directly inspired by adjectives associated with Aries. The final result adds a new type of work to my catalogue and demonstrates a successful approach to

writing programmatic music. I easily feel that *Musica Universalis* is one of my strongest instrumental works, and I intend to use a similar writing approach in future non-vocal pieces.

I am proud to call *Musica Universalis* my dissertation because it does more than highlight my compositional skill. It helped me learn about my own composition process, and it taught me how I can approach works of a scope I rarely take on. Completing an in-depth study of *The Wind in High Places* and *Breathless* also fueled my imagination. When I started writing this piece, I was passingly familiar with both works, and I understood Adams' use of harmonics and wanted to replicate some of his timbres. Both works directly impacted choices that I made while composing *Musica Universalis*. *The Wind in High Places* greatly inspired the compositional germ for "Antares;" Adams' use of transposed motives in "Above Sunset Pass" is a simpler version of the technique that I use throughout "Antares." The use of harmonics throughout *The Wind in High Places* also inspired the colors used in "Pollux."

Breathless has been a rewarding and informative work to study and compare to my own writing. Chris Arrell was my first composition instructor. Although I have studied his music in the past, I did so as a very young, undergraduate student. I have also wanted to explore a work of his as a peer. It has been a decade since I studied with him, and I treat analyzing *Breathless* as an opportunity to compare my own compositional language with his. I began studying the work after the majority of *Musica Universalis* was written, and I found that most of the techniques discussed in chapter 3 were also present in my own music. It appears to me that Arrell has left a clear impression on my writing and the sensation is akin to discovering a part of one's ancestry.

The last thing I will discuss is what I have learned from writing for this particular instrumentation. This work is personal in nature because I wrote it with specific people in mind.

It was not written just for flute, harp, viola, clarinet, and piano, but rather specifically for: Mihoko Watanabe (flute), Katrin Meidell (viola), Elizabeth Crawford (clarinet), and Elizabeth Richter (harp). I wrote *Musica Universalis* as more than something to further develop my skills in musical composition; it is something that I hope these four musicians and peers genuinely enjoy performing. Because there are no other major chamber works with this instrumentation, I felt more free in what I could do in pairing instruments. Certain instruments tend to be paired throughout *Musica Universalis*, but I try to practice my philosophy of chamber music in which each one is treated as an individual performer in the work and gets a turn performing interesting passages. Additionally, each instrument performs duets and trios with other instruments throughout the work. I have enjoyed using advanced performance techniques to add timbral colors to the work. I truly hope this work is received by future performers as one crafted with love for performance in mind.

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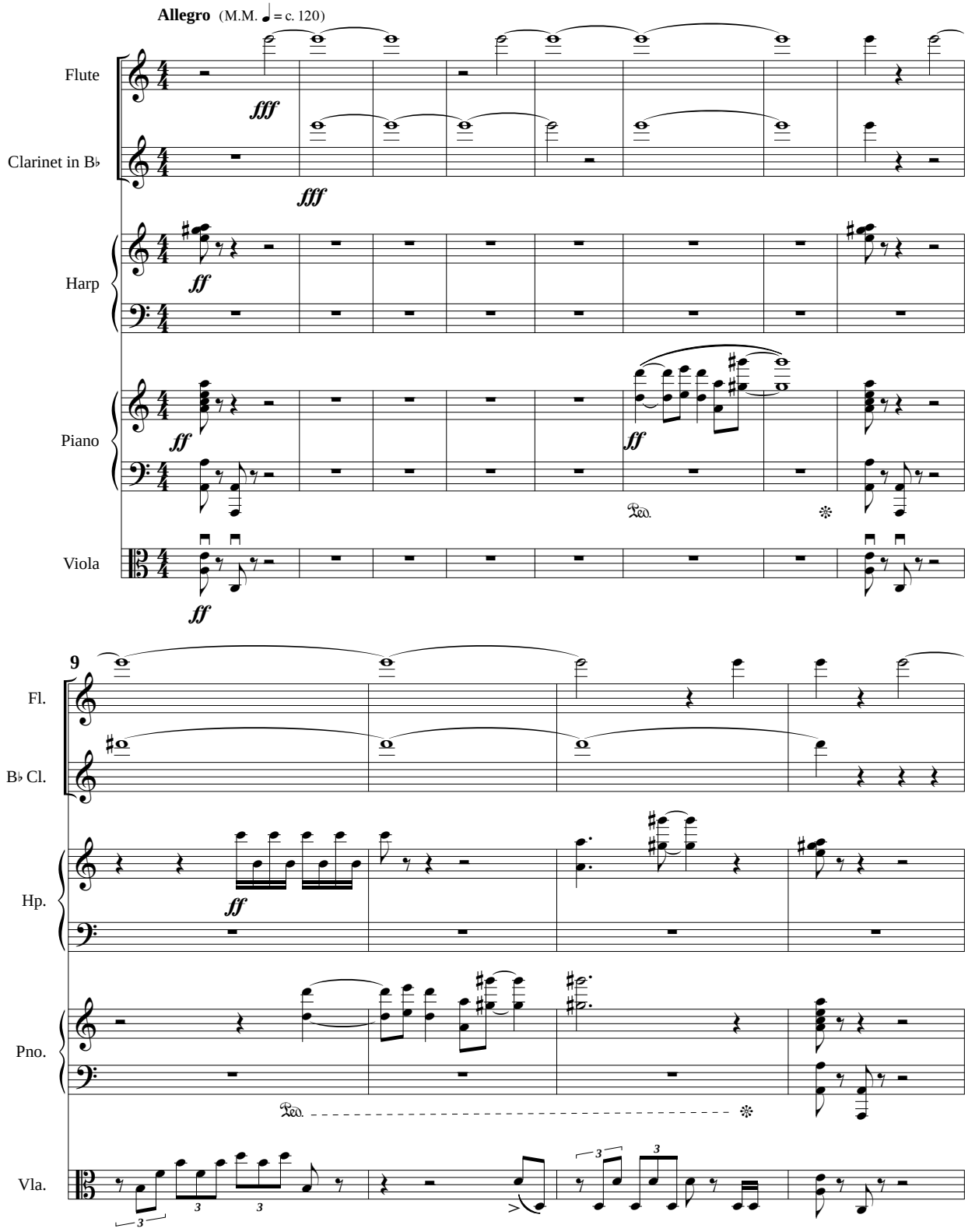
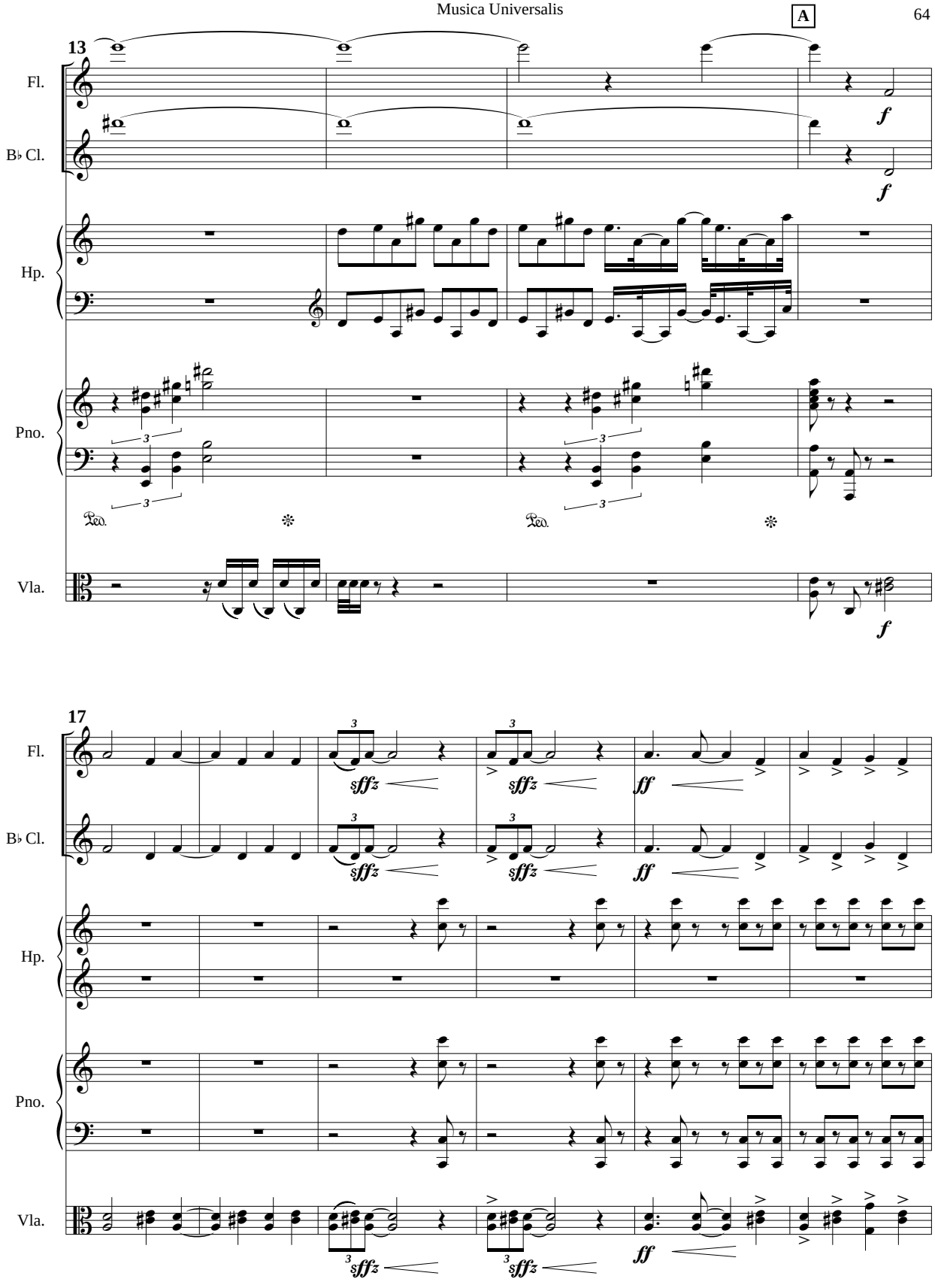
C-SCORE

Musica Universalis

I: Hamal

Salvatore A. LoCascio

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13
Fl.
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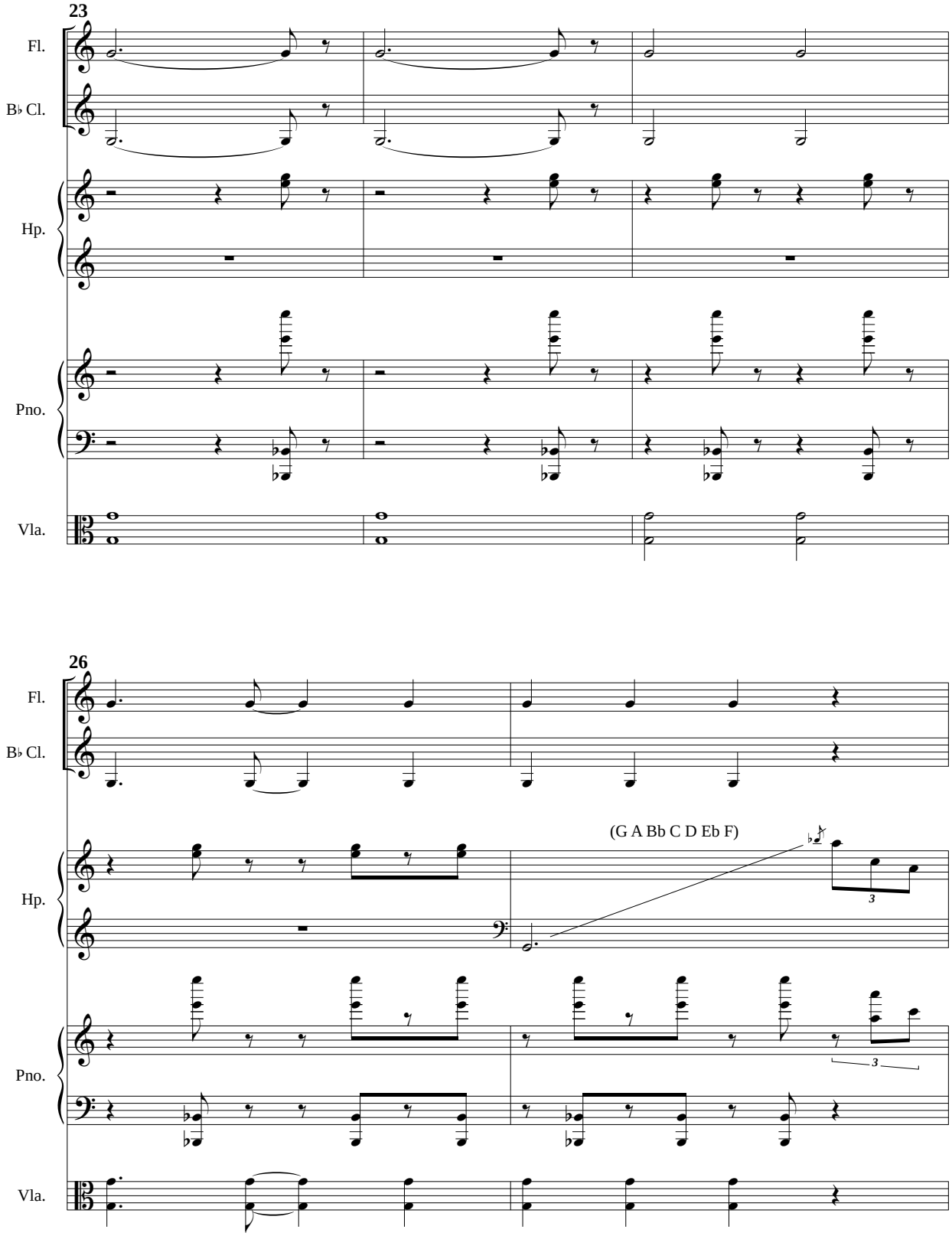
17
sffz
ff


23
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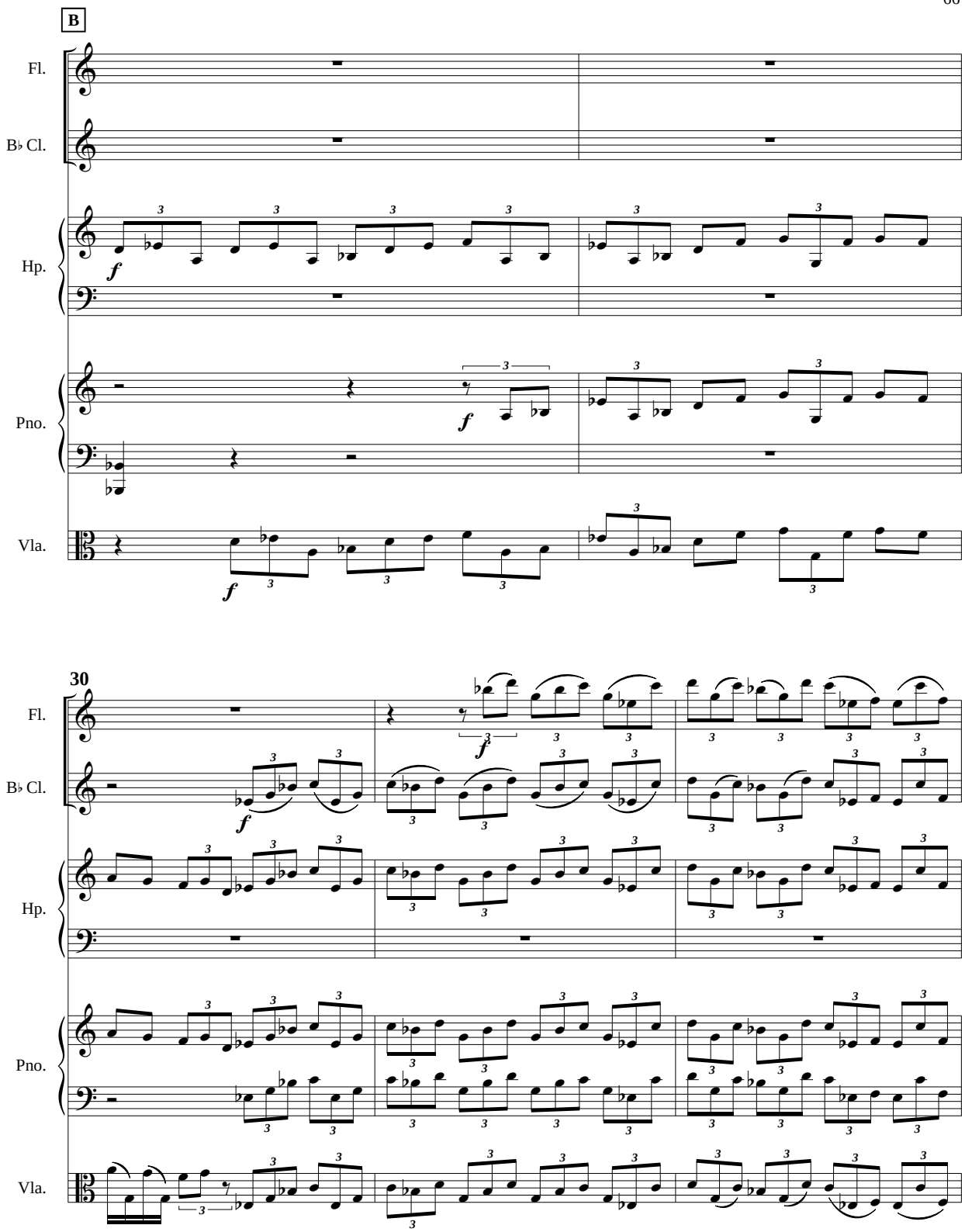
Pno.
Vla.
26
Fl.
B♭ Cl.
(G A Bb C D Eb F)
Hp.
Pno.
Vla.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B♭ Cl.
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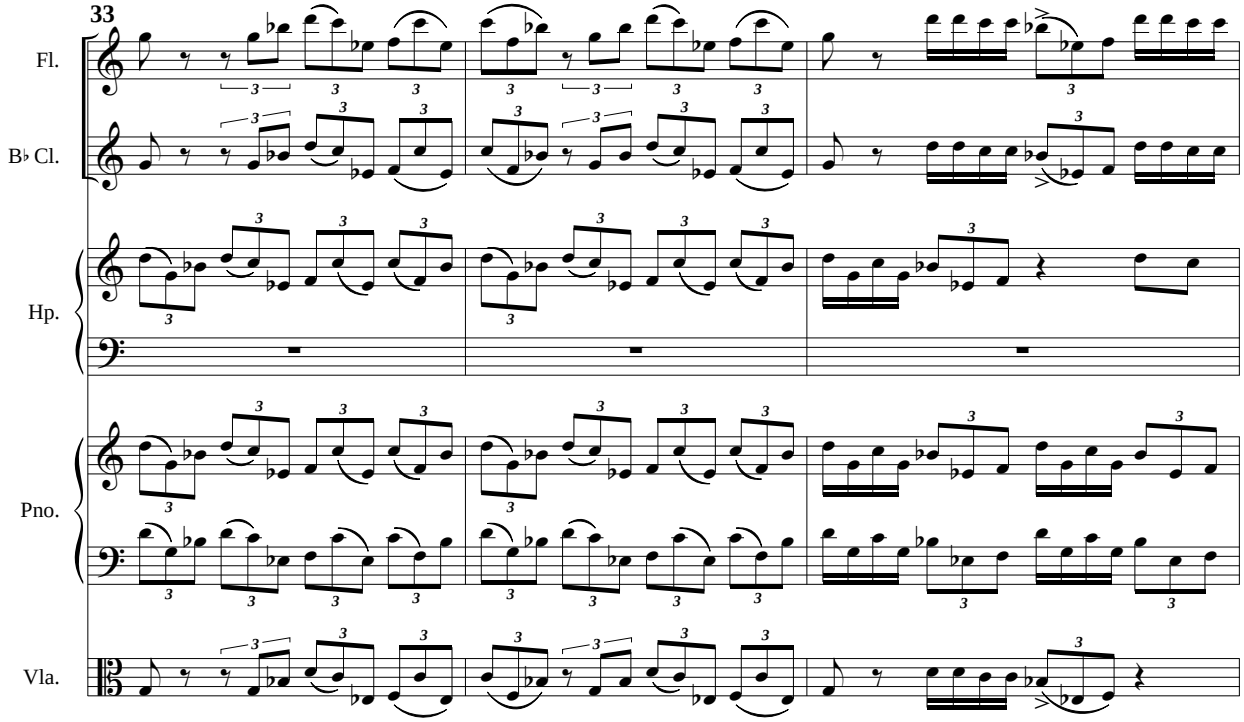
Vla.
f
30


33
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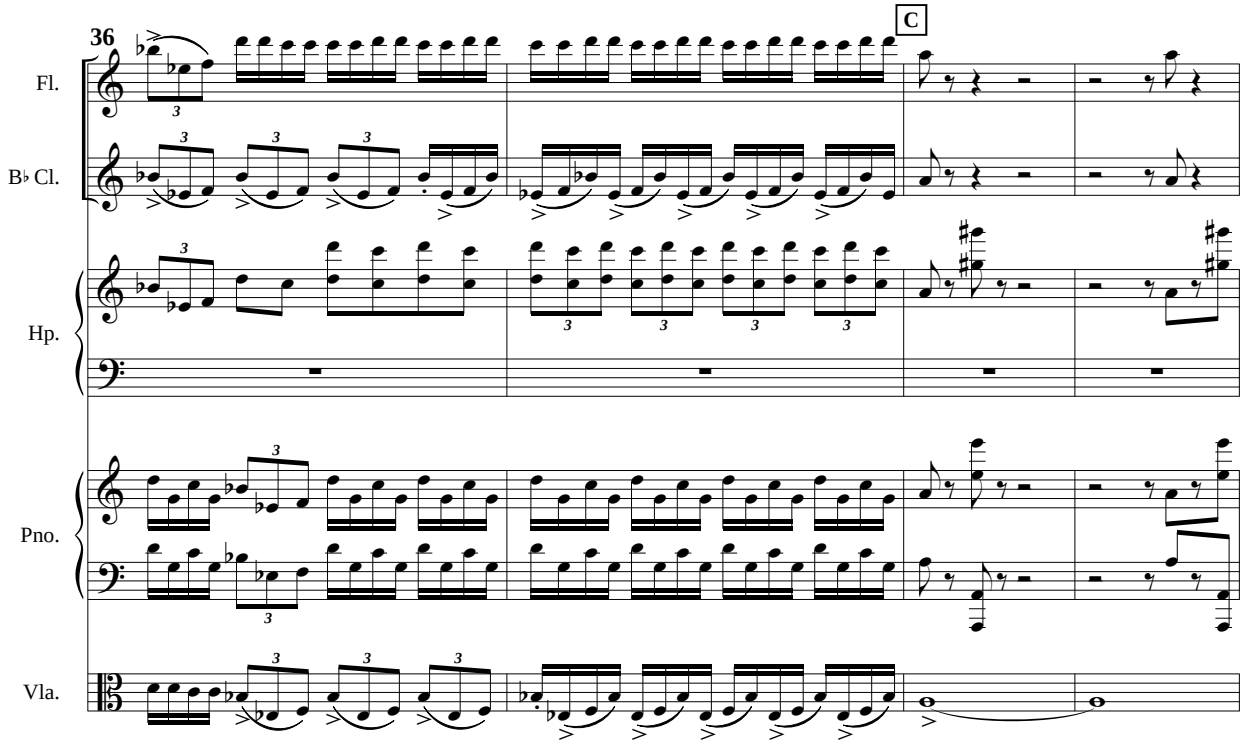
Vla.


36
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Fl.
B♭ Cl.
Hp.
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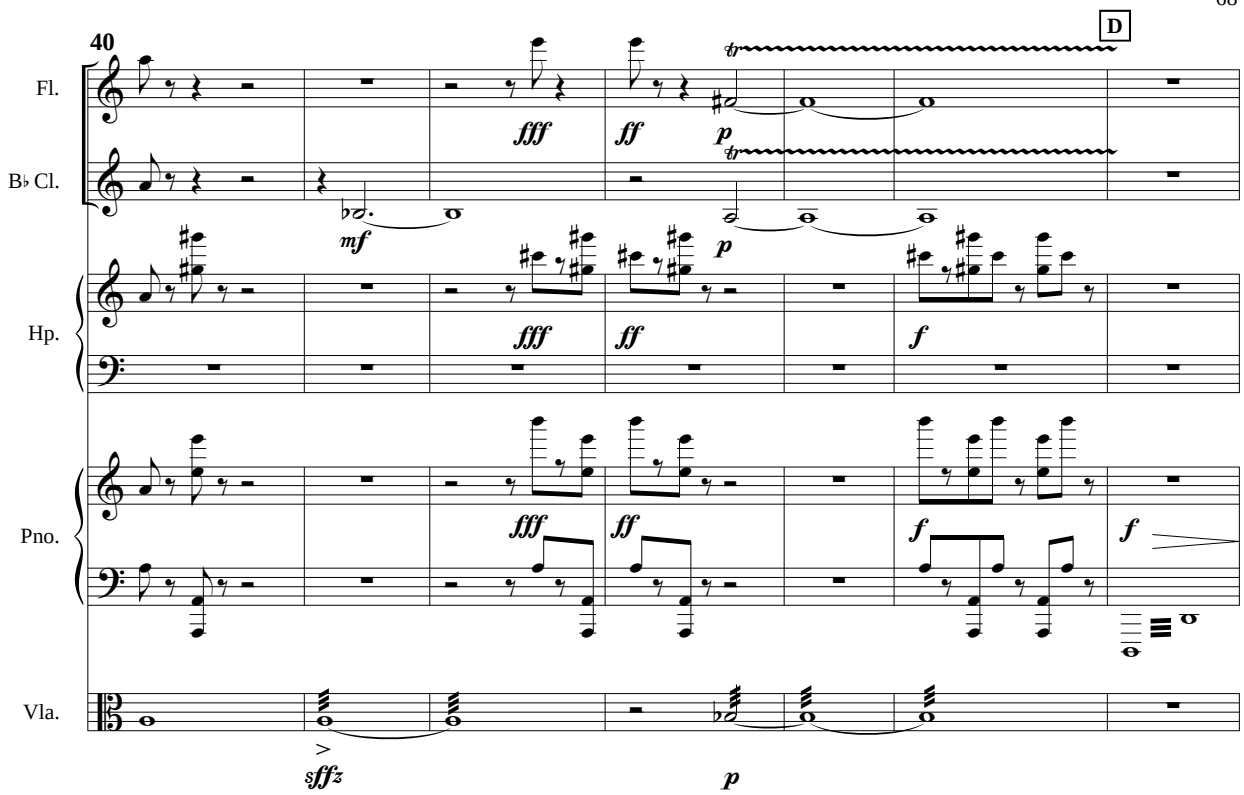
Vla.


40
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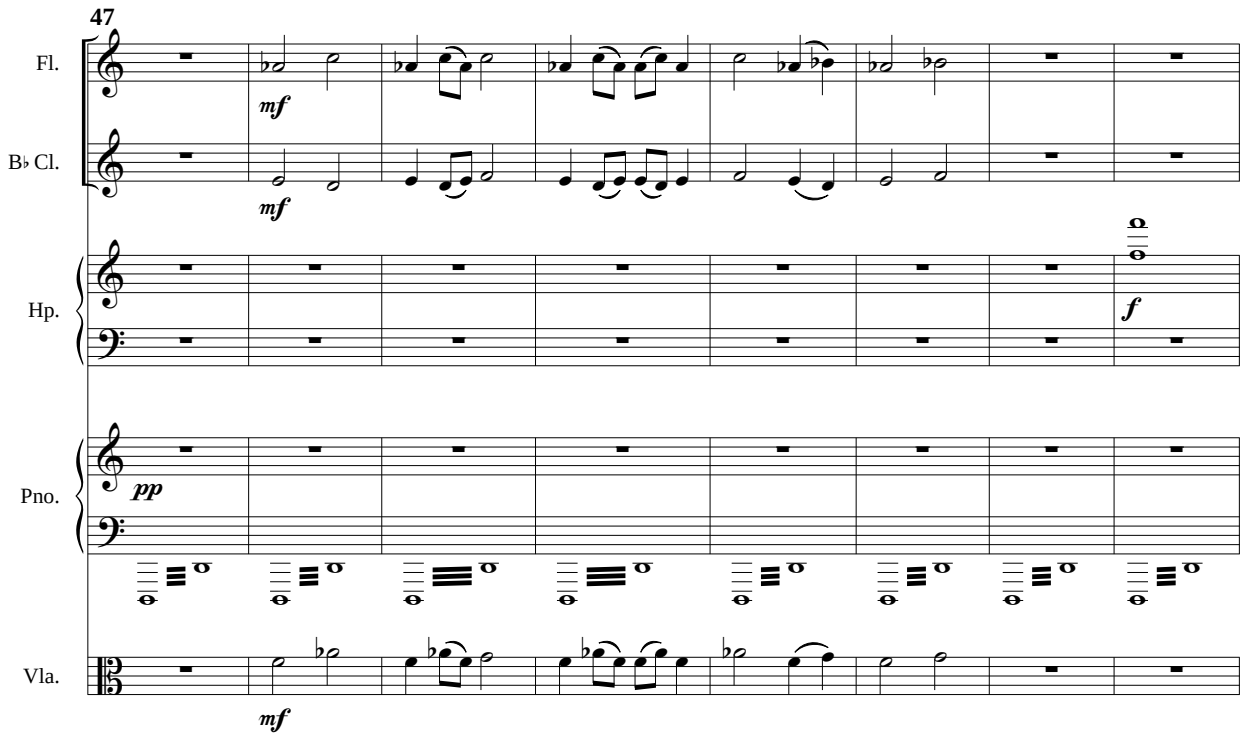
Hp.
Pno.
Vla.
fff
ff
p
mf
f
sffz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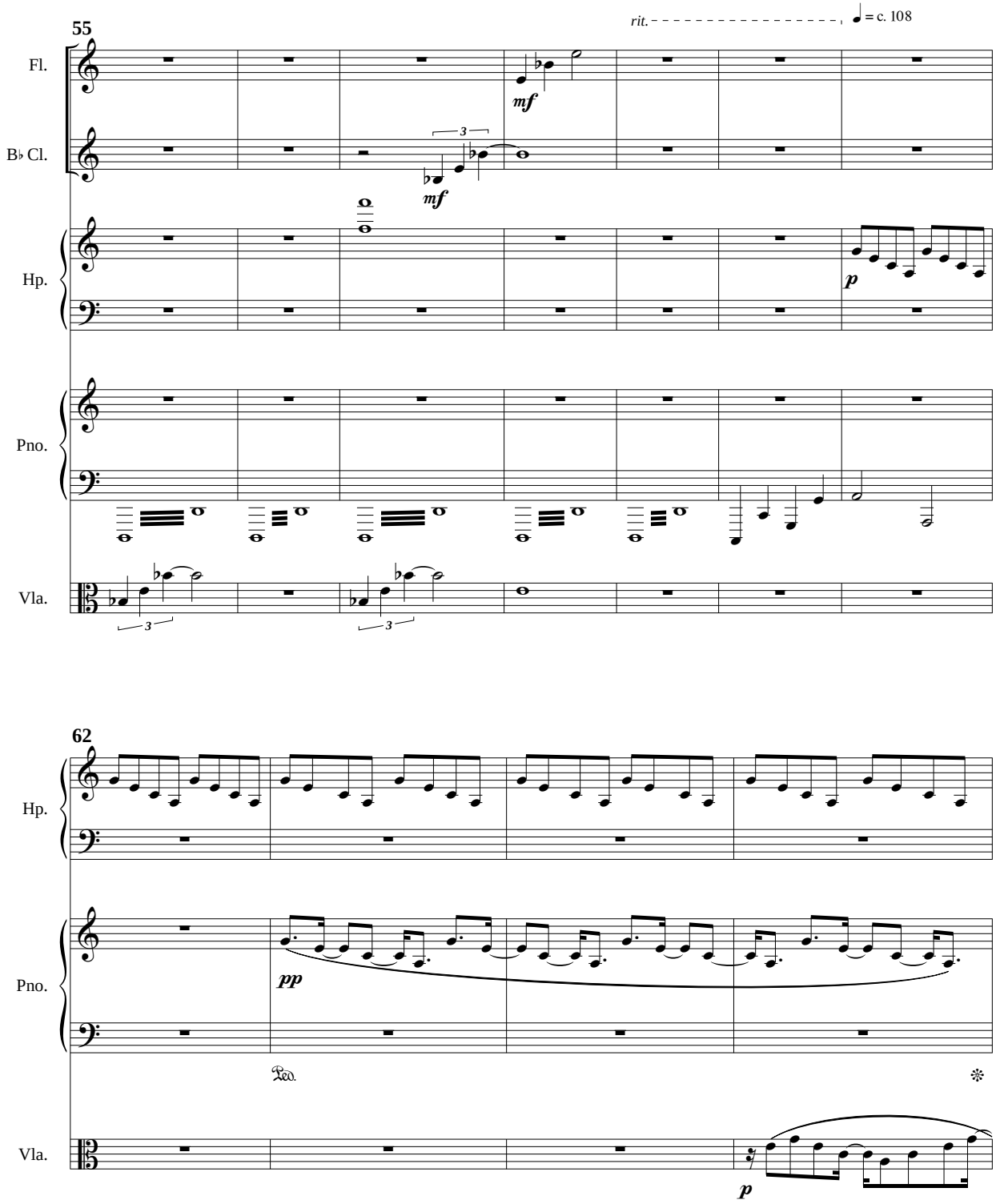
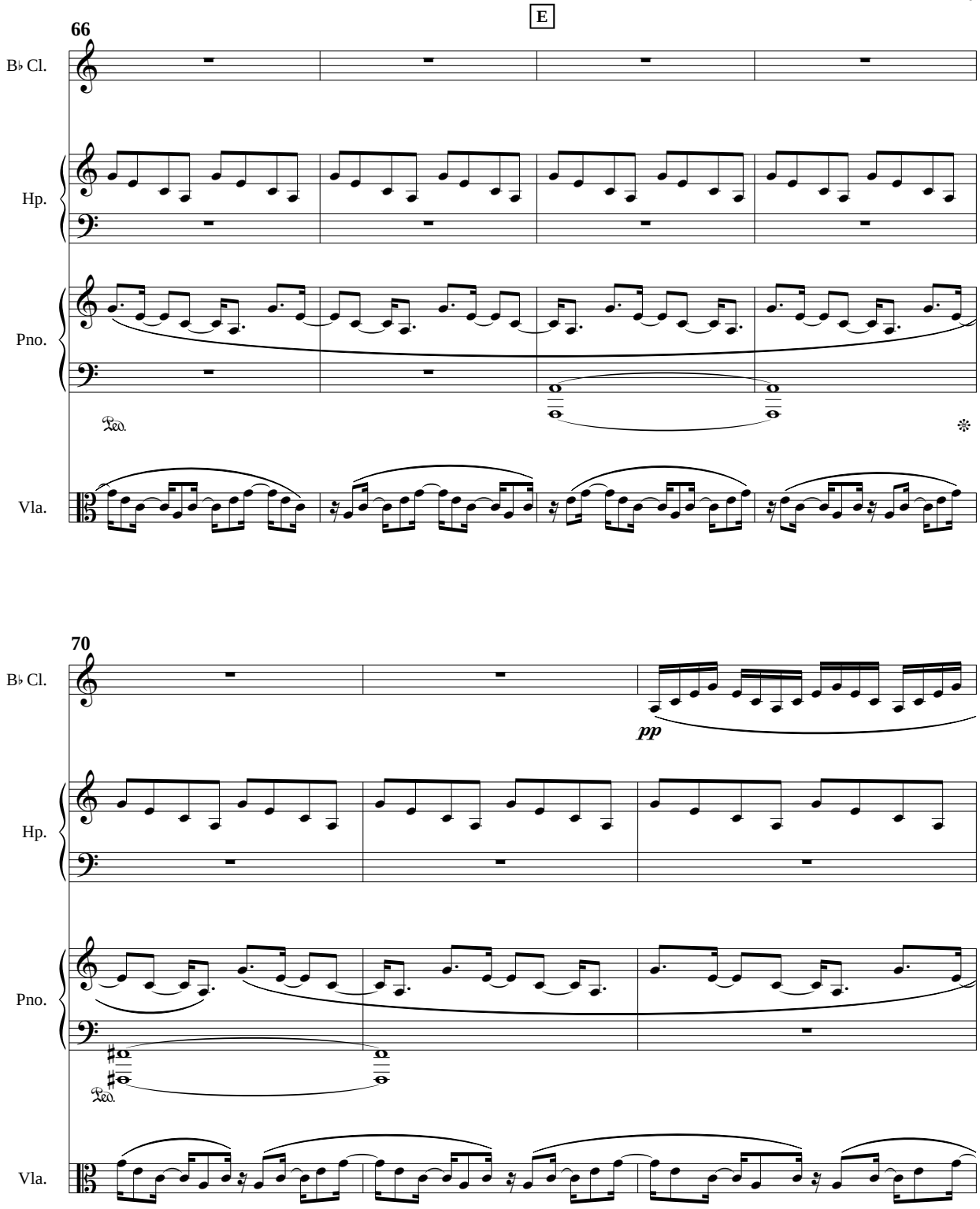
Pno.
Vla.
mf
f
pp


55
rit.
♩ = c. 108
Fl.
mf
B♭ Cl.
3
mf
Hp.
p
Pno.
Vla.
3
3
62
Hp.
Pno.
pp
Ped.
Vla.
p


E
66
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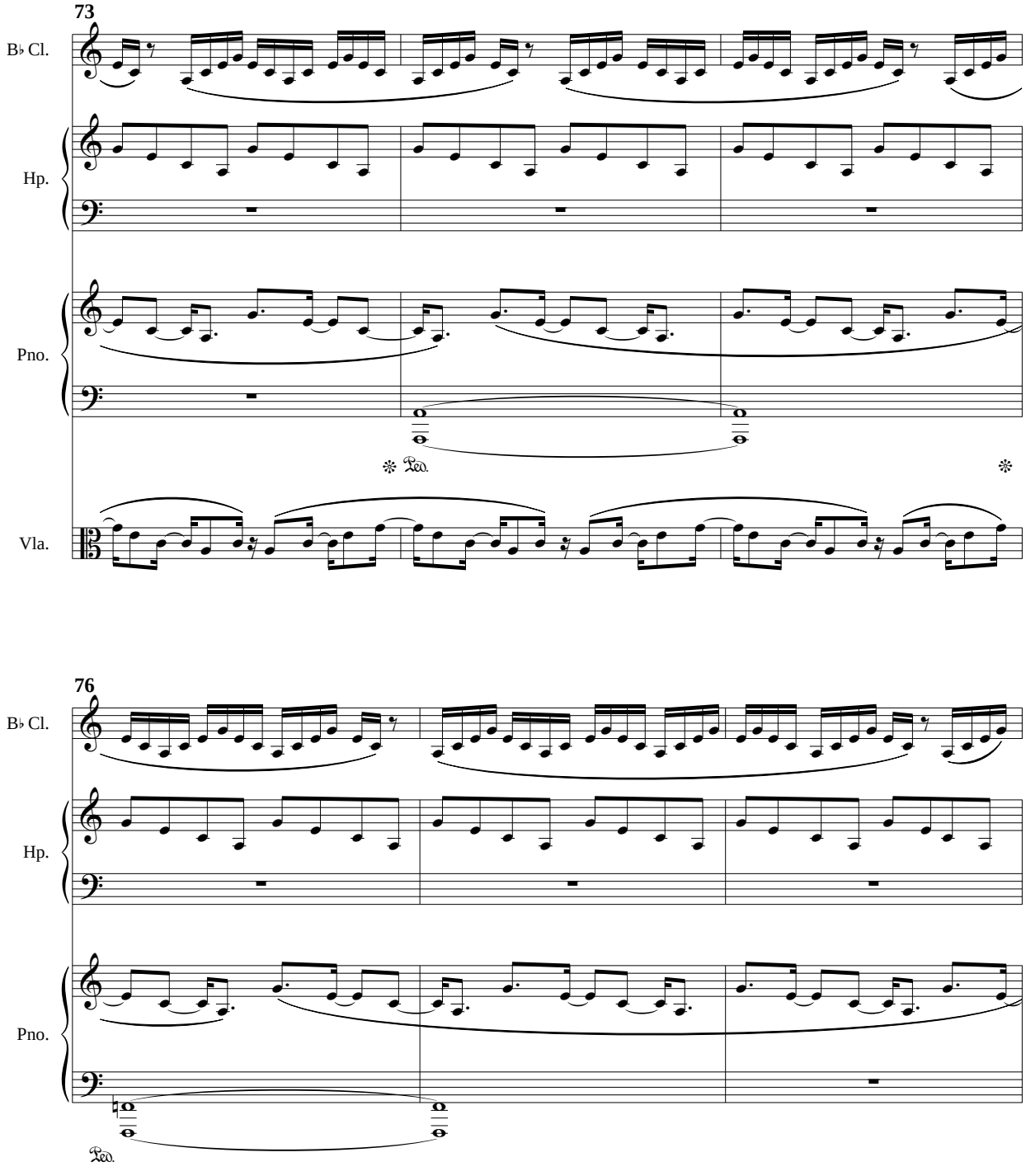
Pno.
Vla.
70
pp


73
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Hp.
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Vla.
Ped.
76
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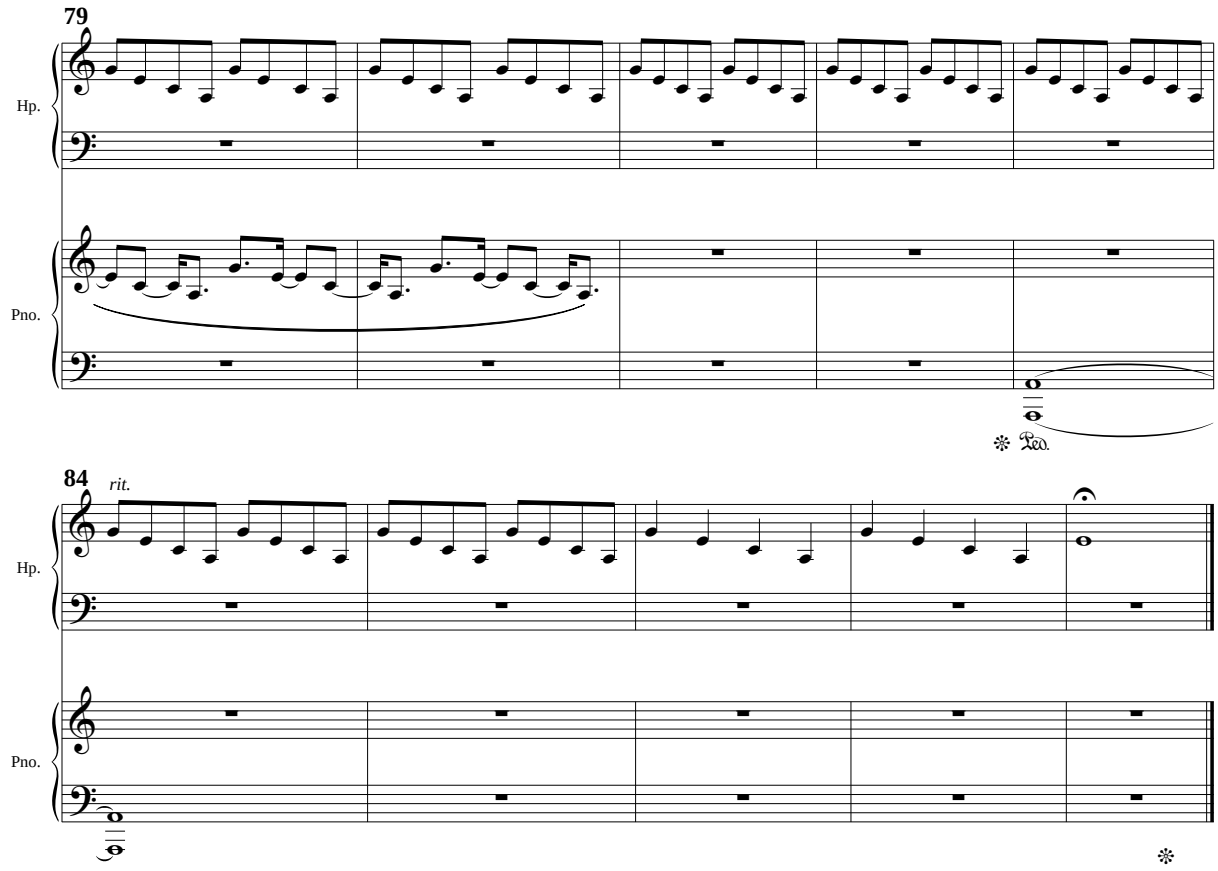
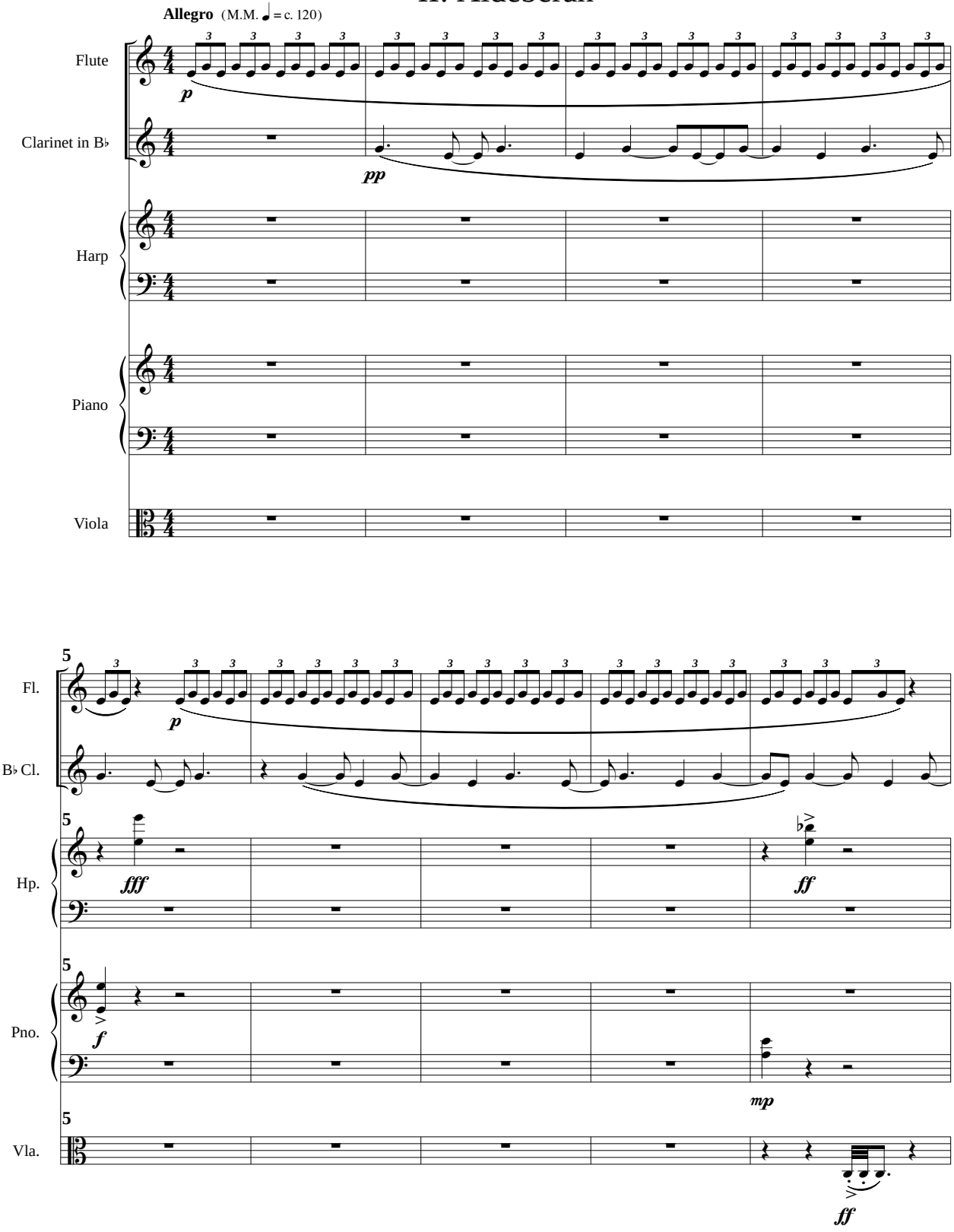
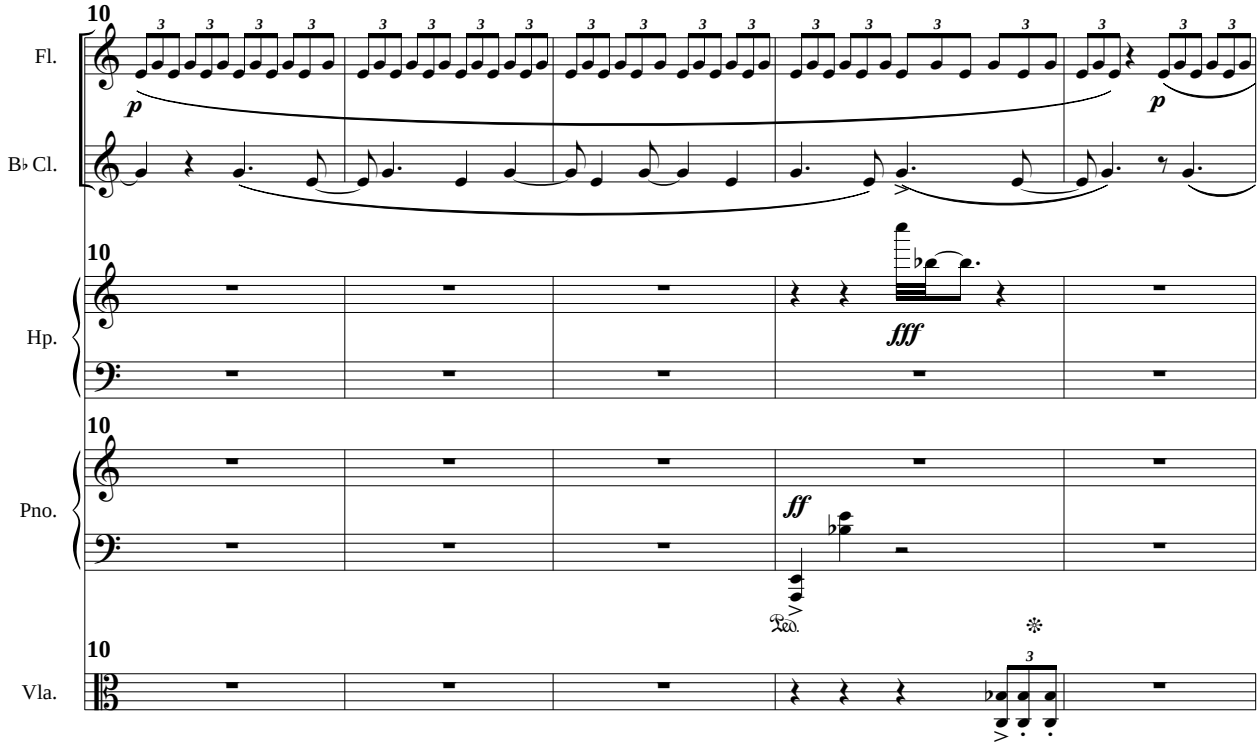
Hp.
Pno.
Ped.


79
Hp.
Pno.
84
rit.
Hp.
Pno.

II: Aldeberan




10
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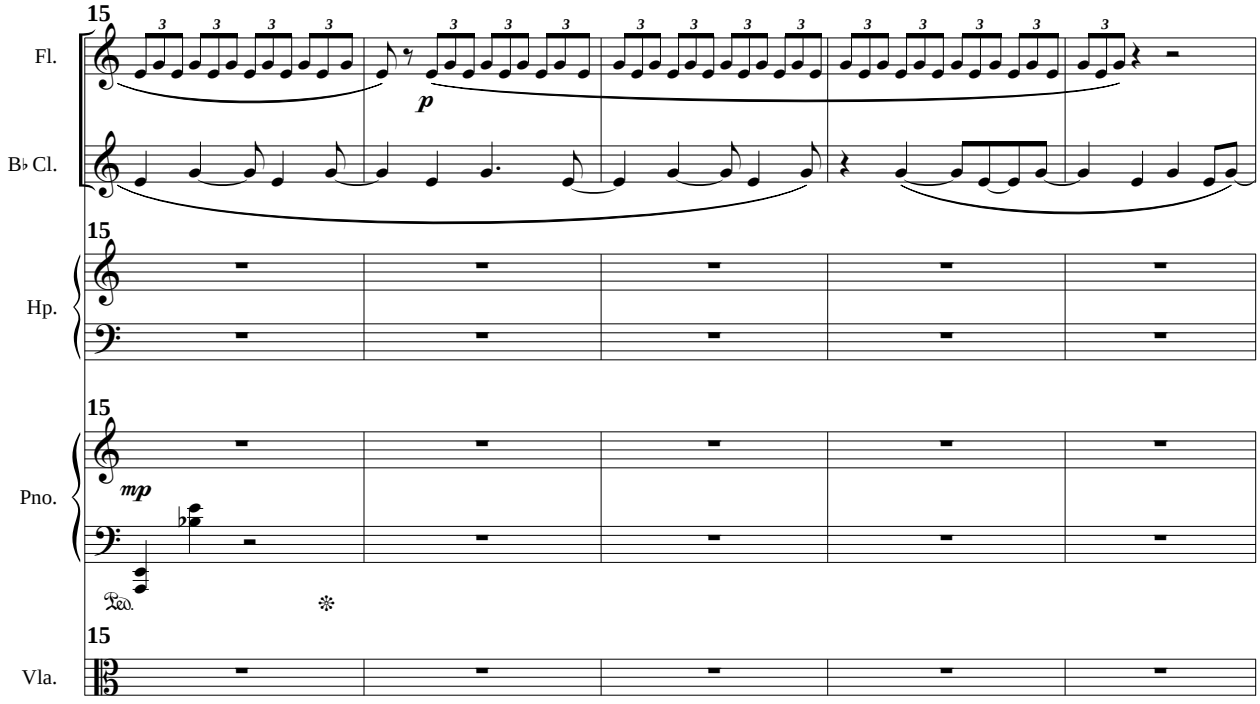
B♭ Cl.
Hp.
Pno.
Vla.
p
p
fff
ff
Ped.


15
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Hp.
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Vla.
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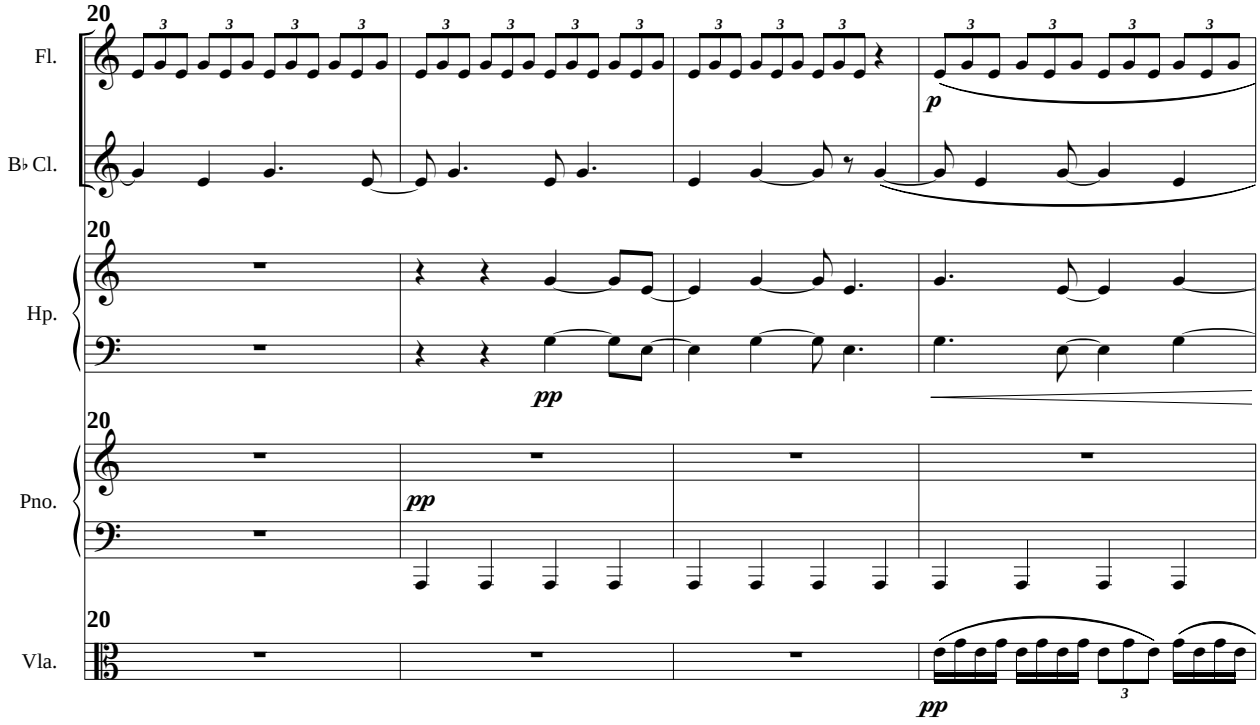
mp
Ped.


20
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Vla.
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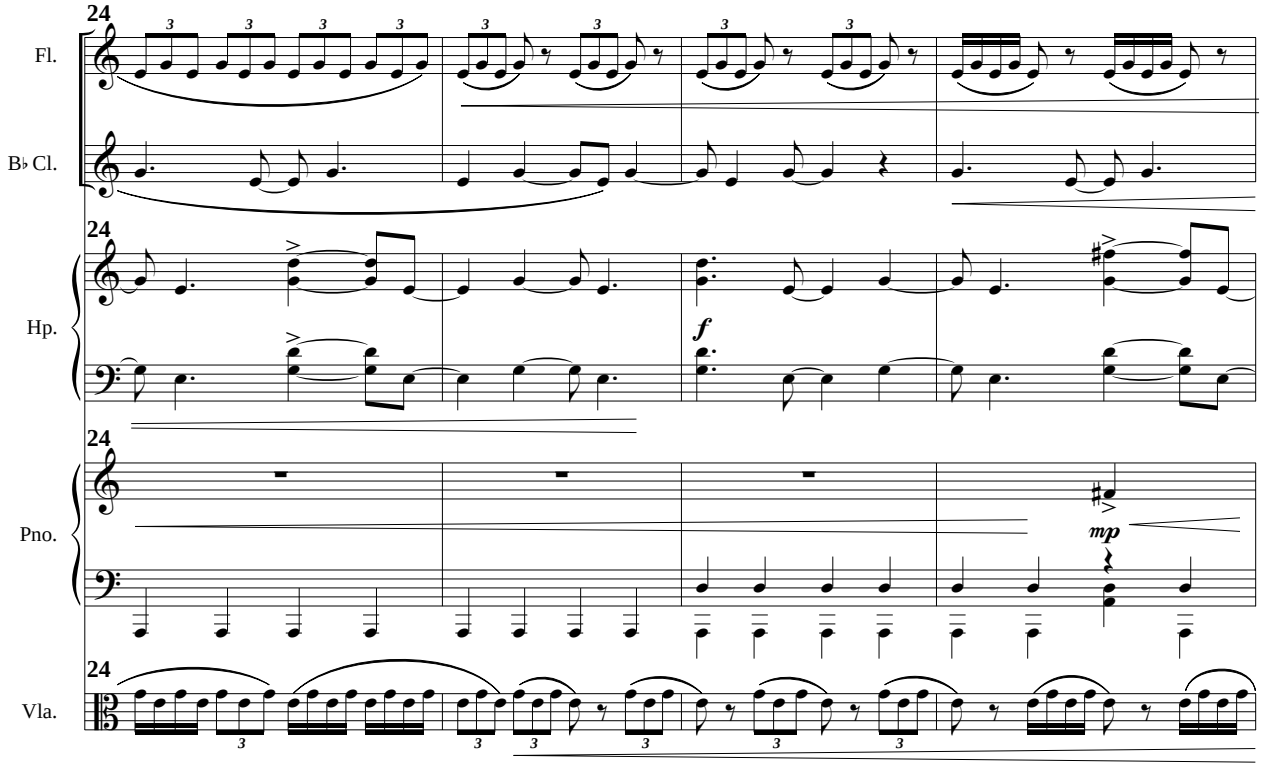
pp
pp


24
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Hp.
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Vla.
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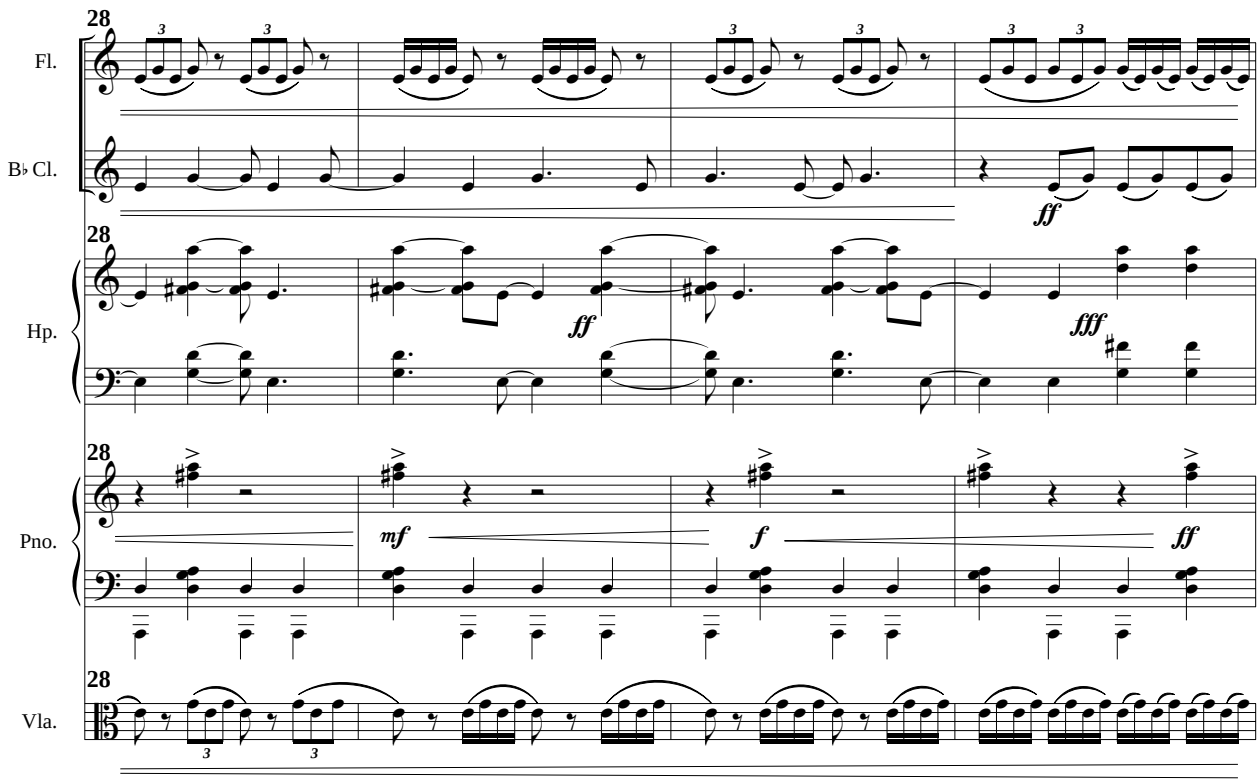
28
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Hp.
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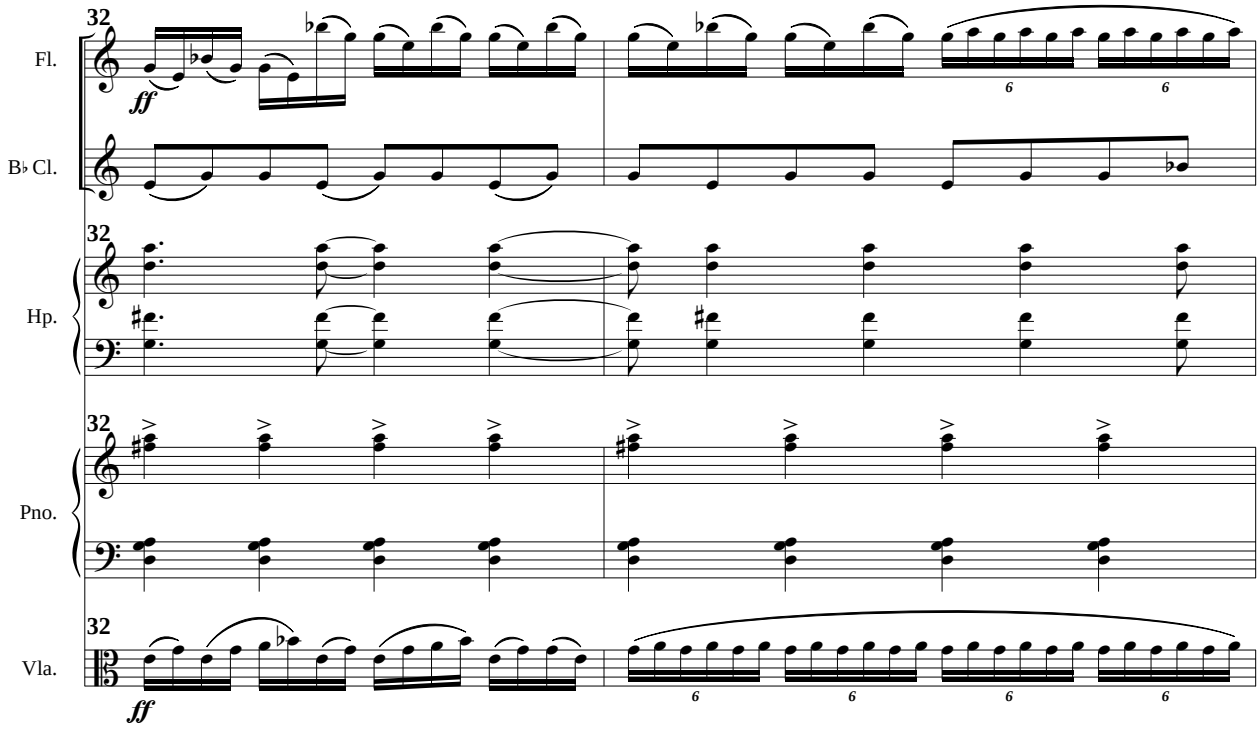
Vla.
ff
fff
mf
f


32
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
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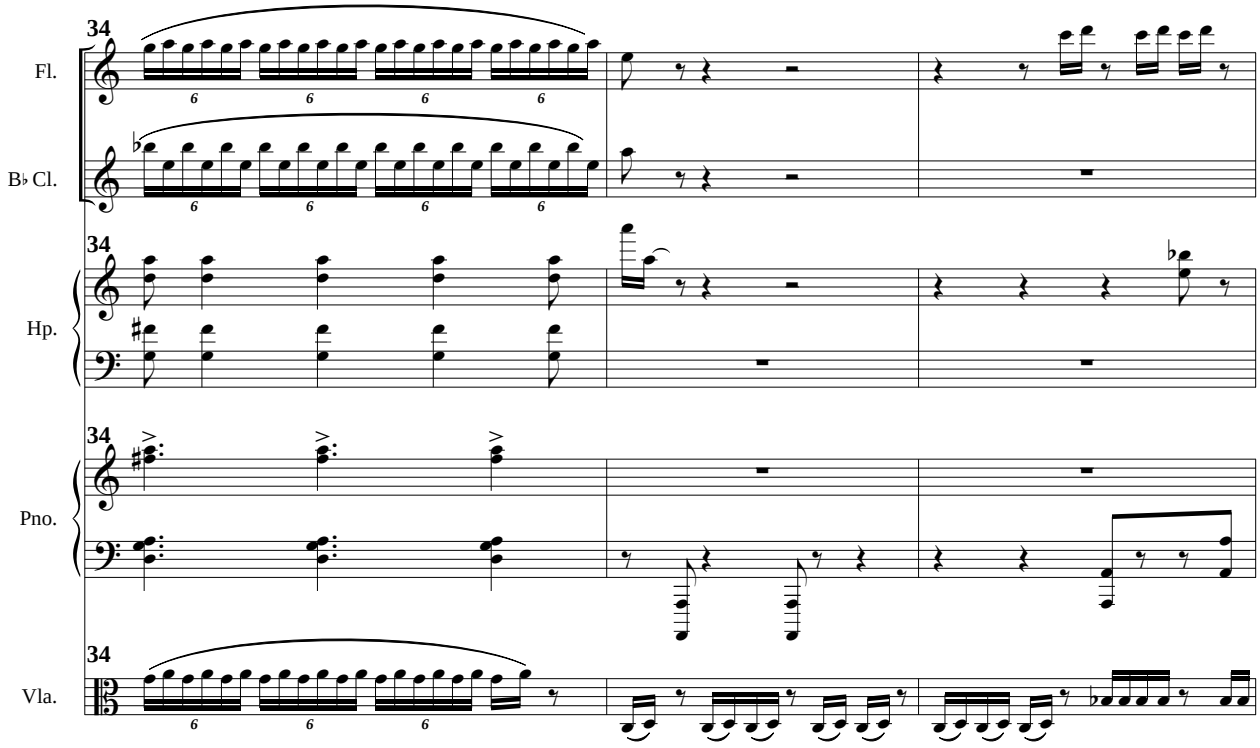
34
Fl.
B♭ Cl.
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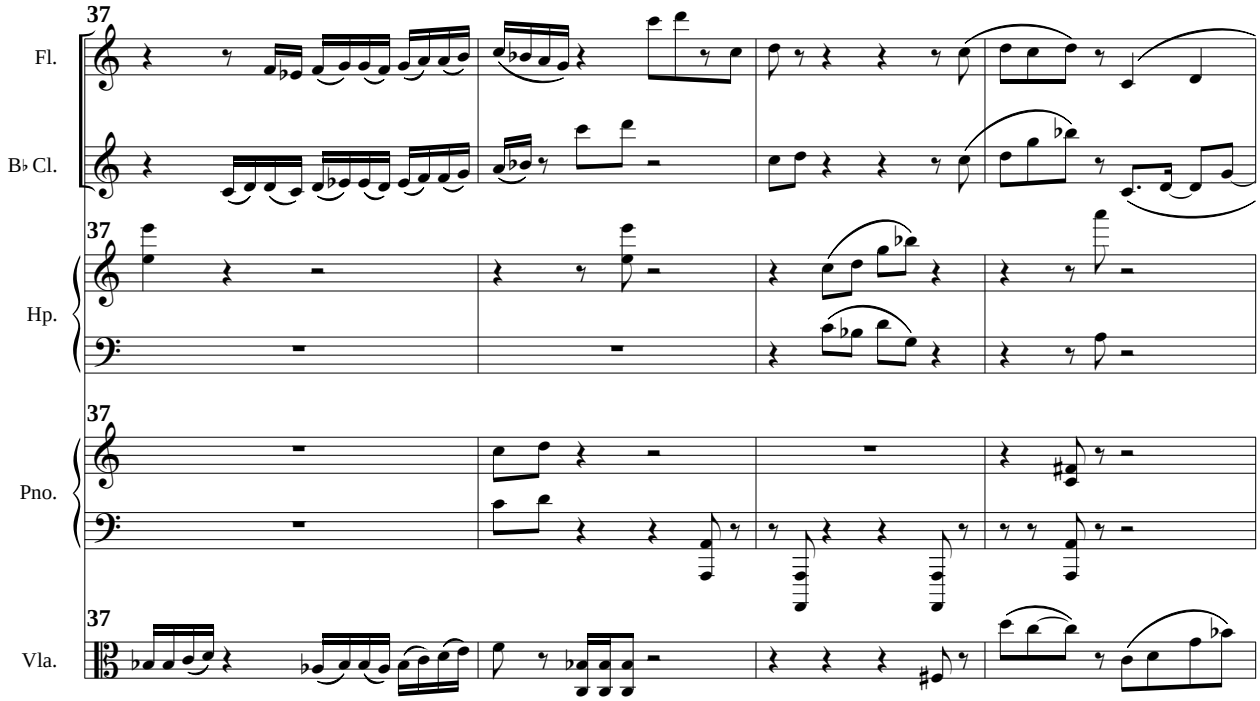
37
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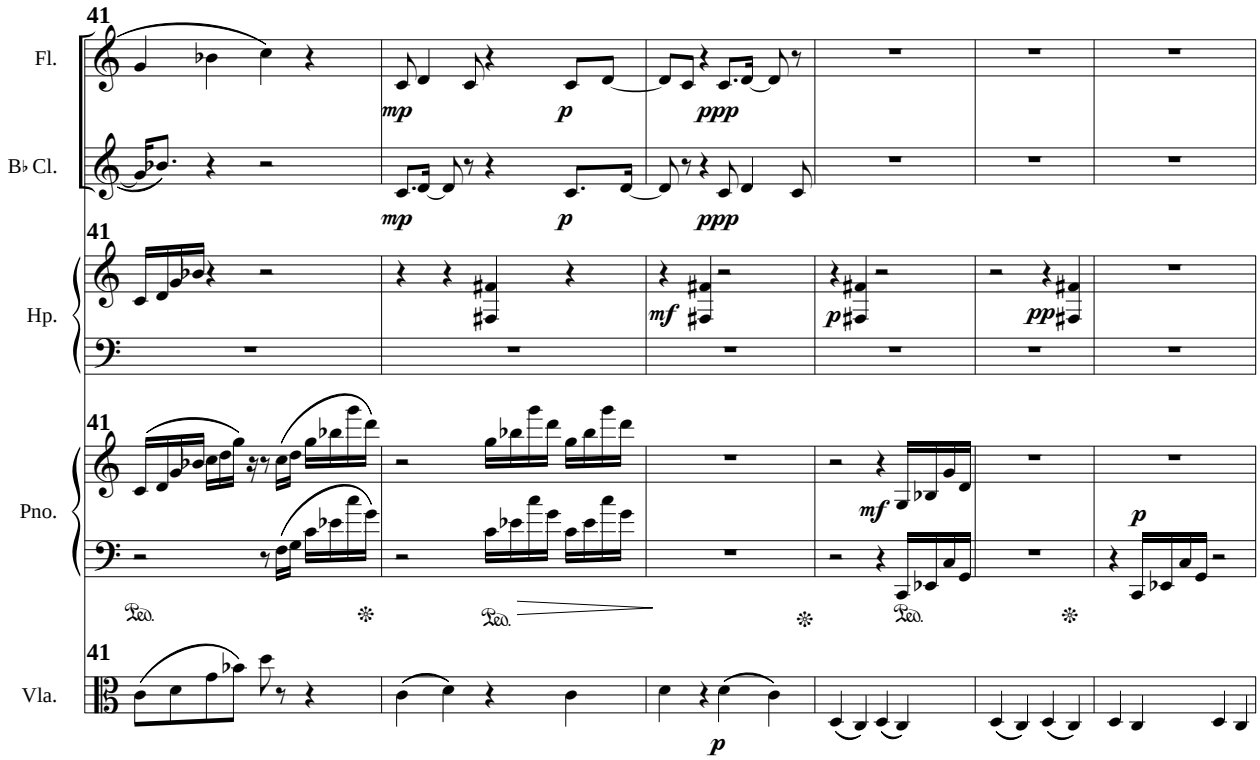
Pno.
Vla.


41
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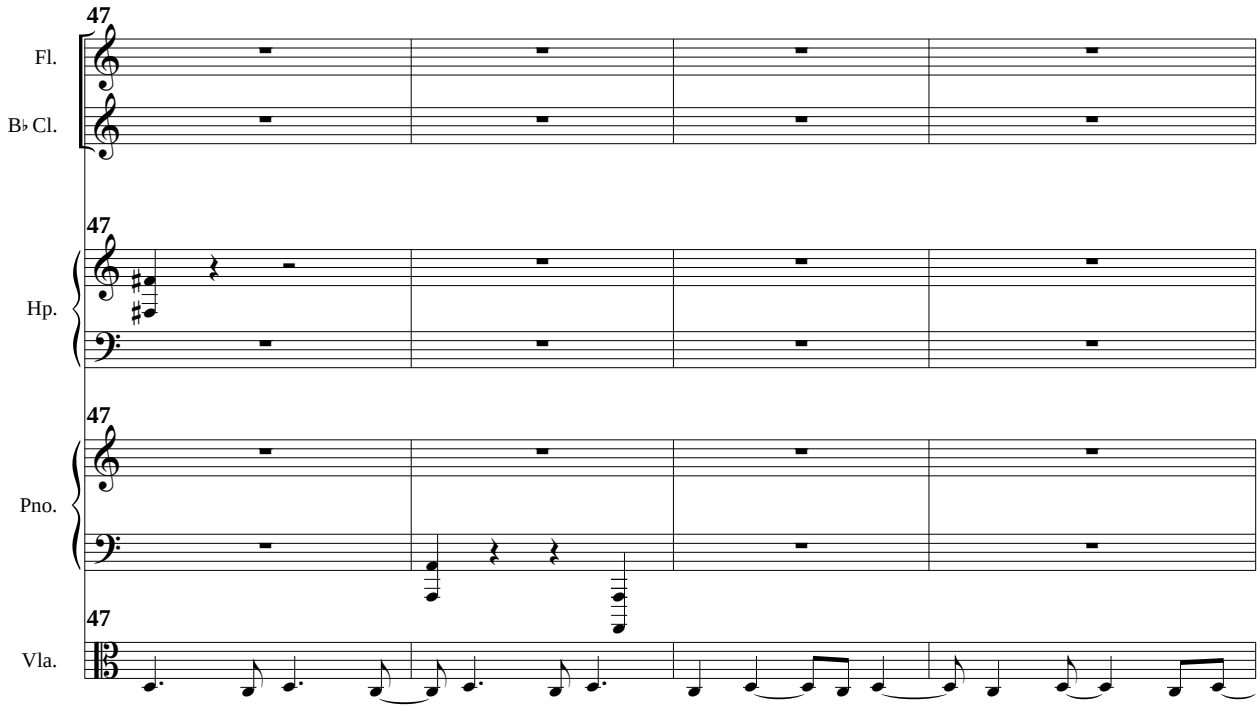
Pno.
Vla.
mp
p
ppp
mf
pp
Ped.


47
Fl.
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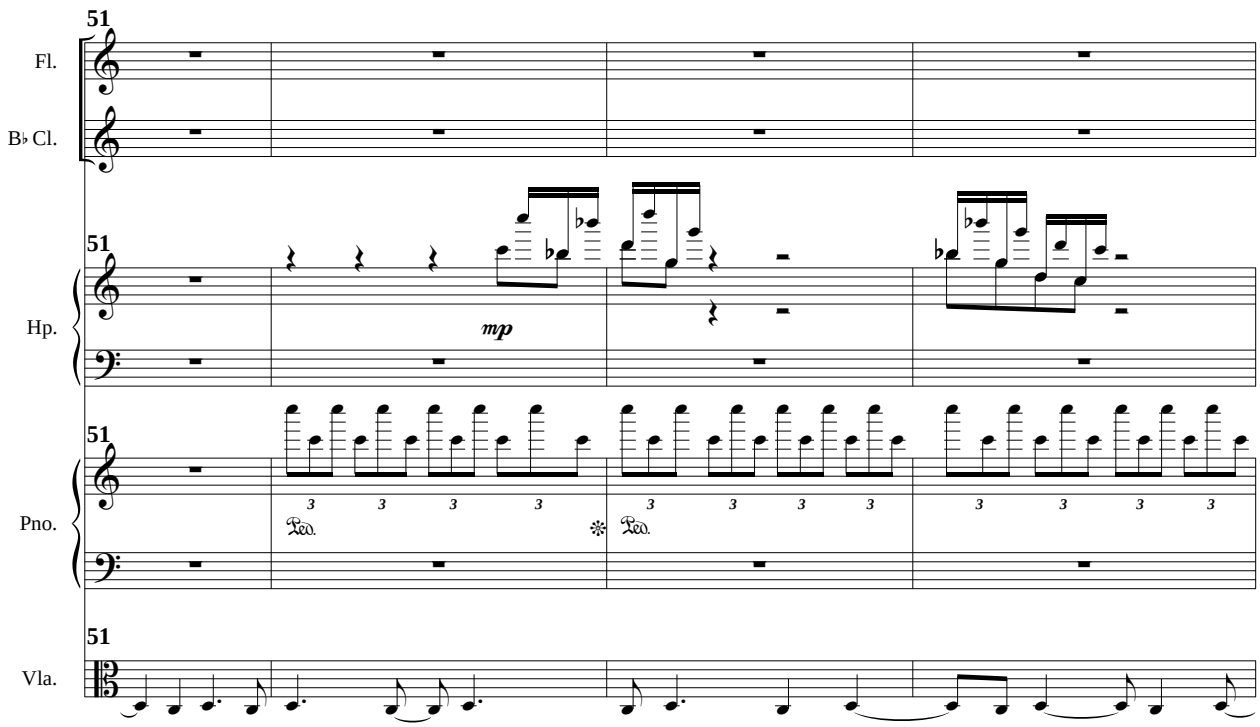
Pno.
Vla.


51
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B♭ Cl.
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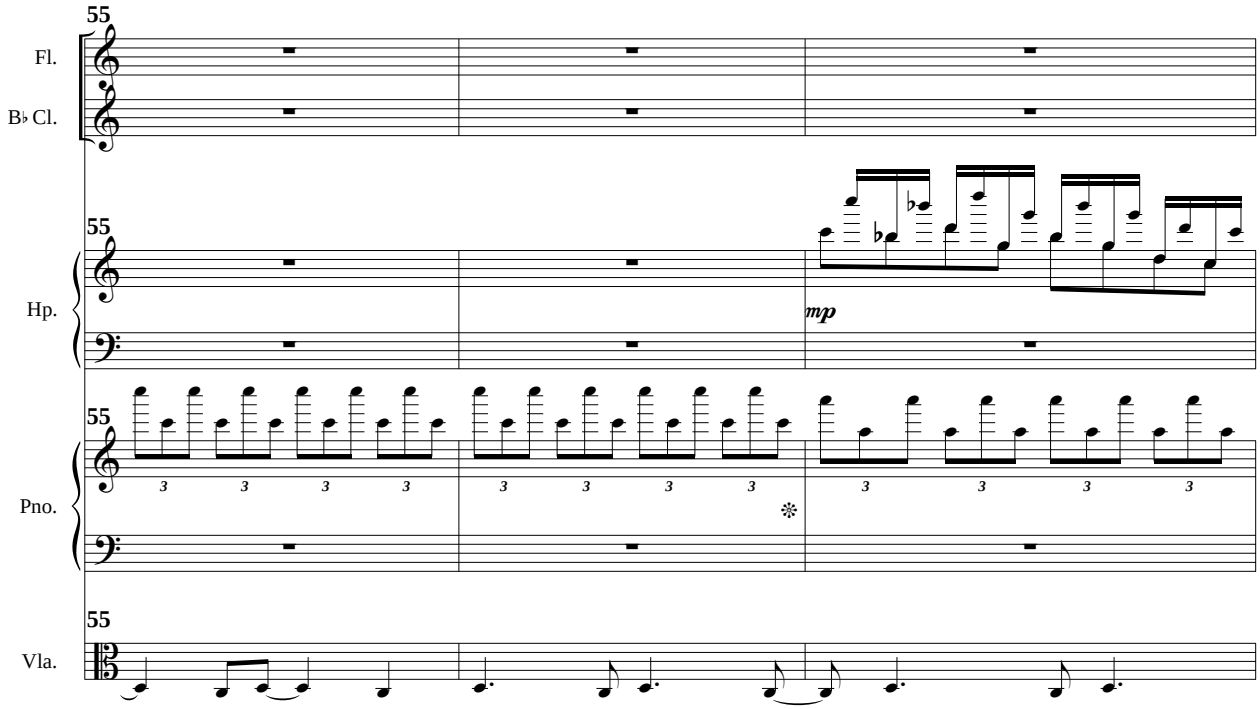
Pno.
Ped.
Ped.
Vla.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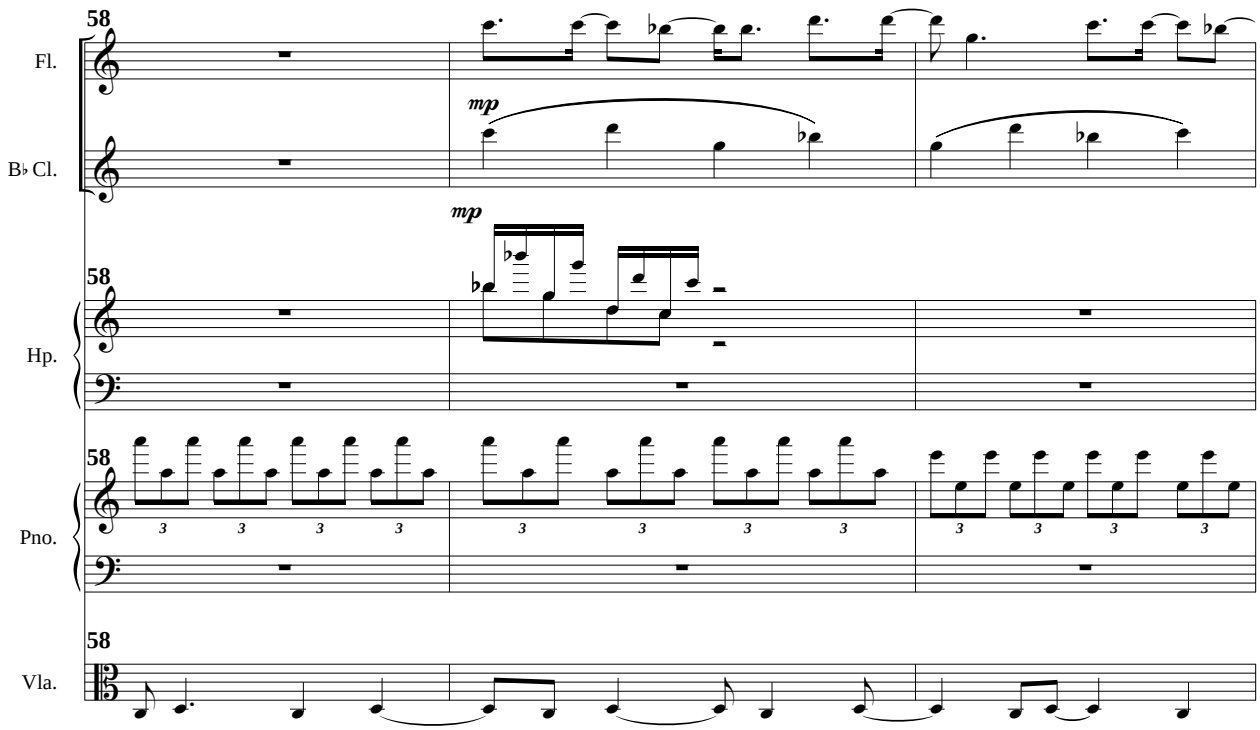
Pno.
Vla.


58
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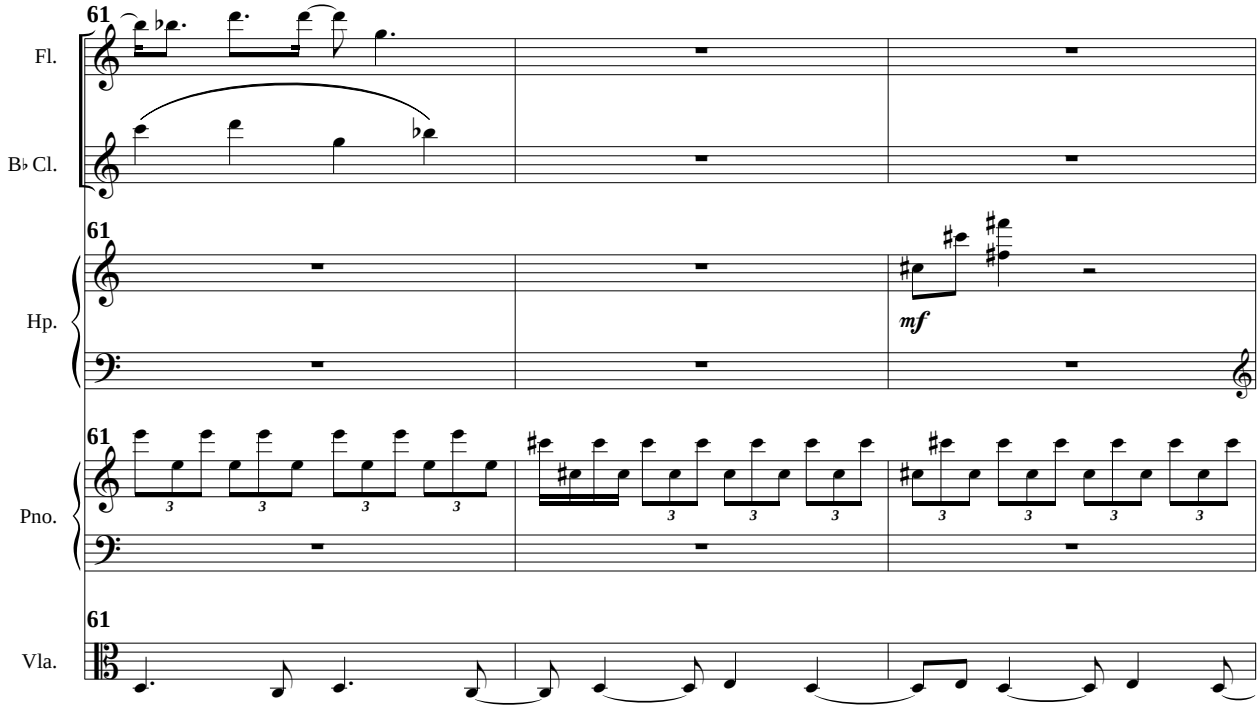
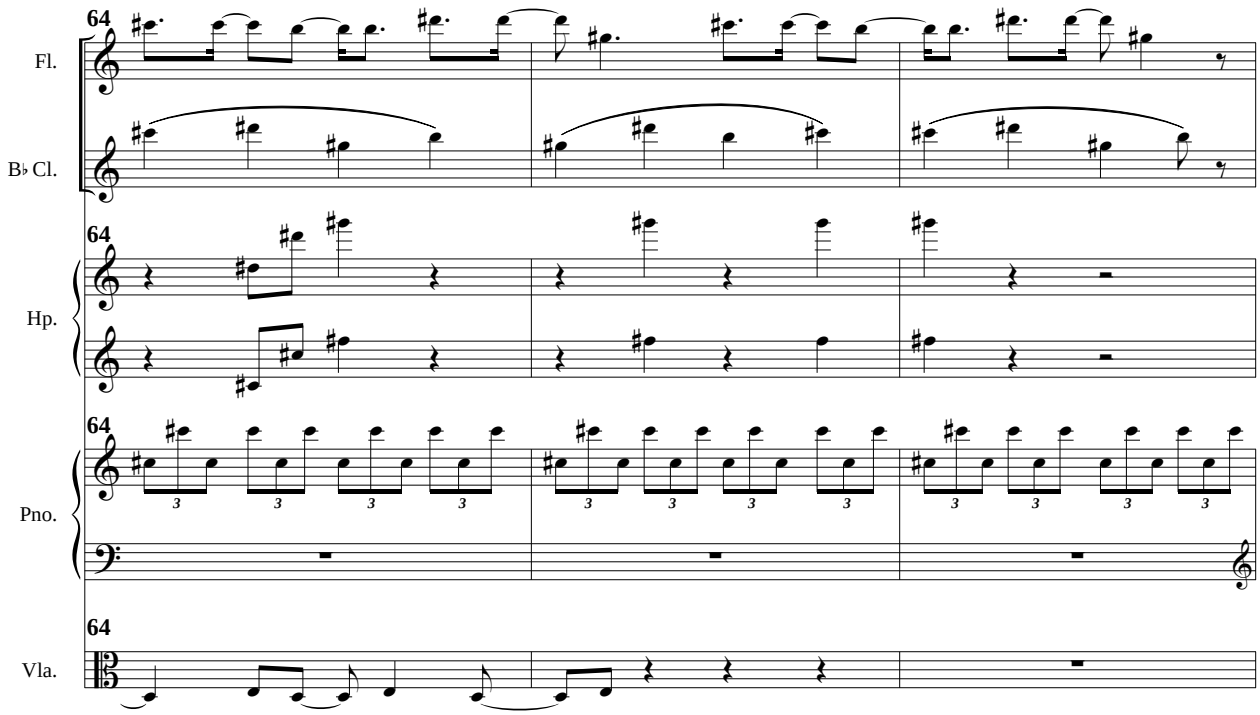
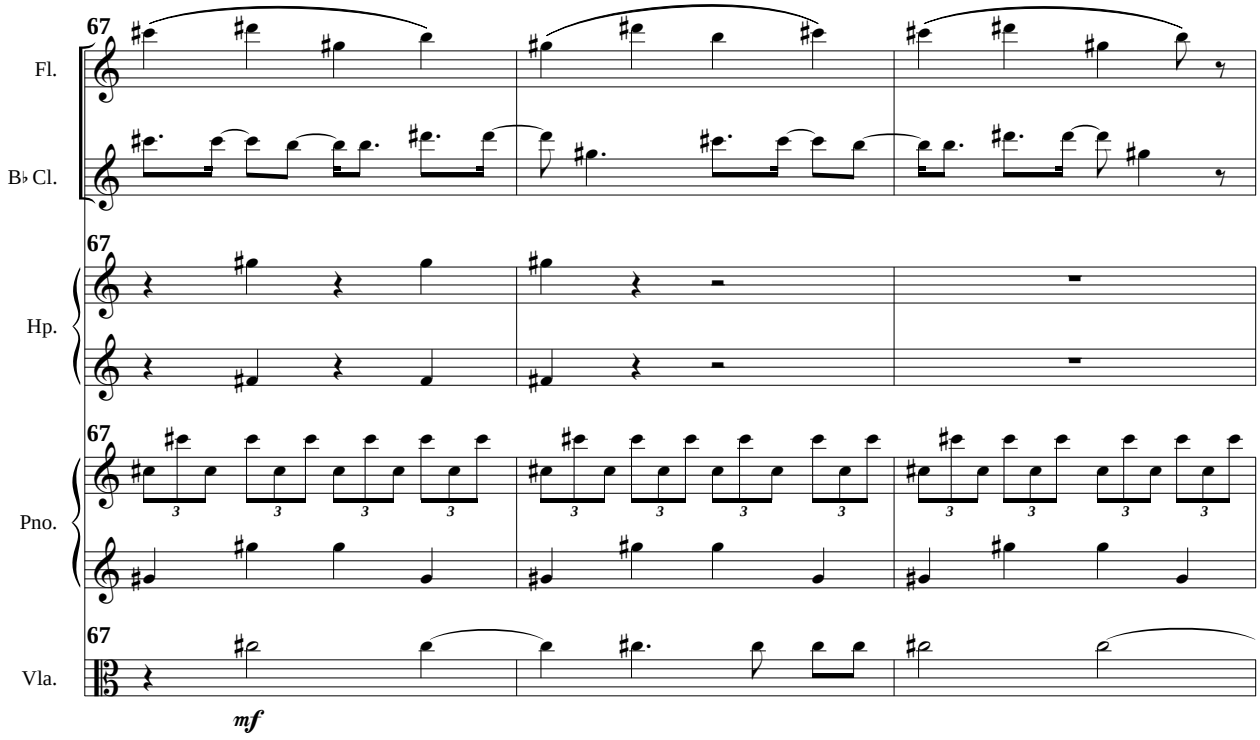
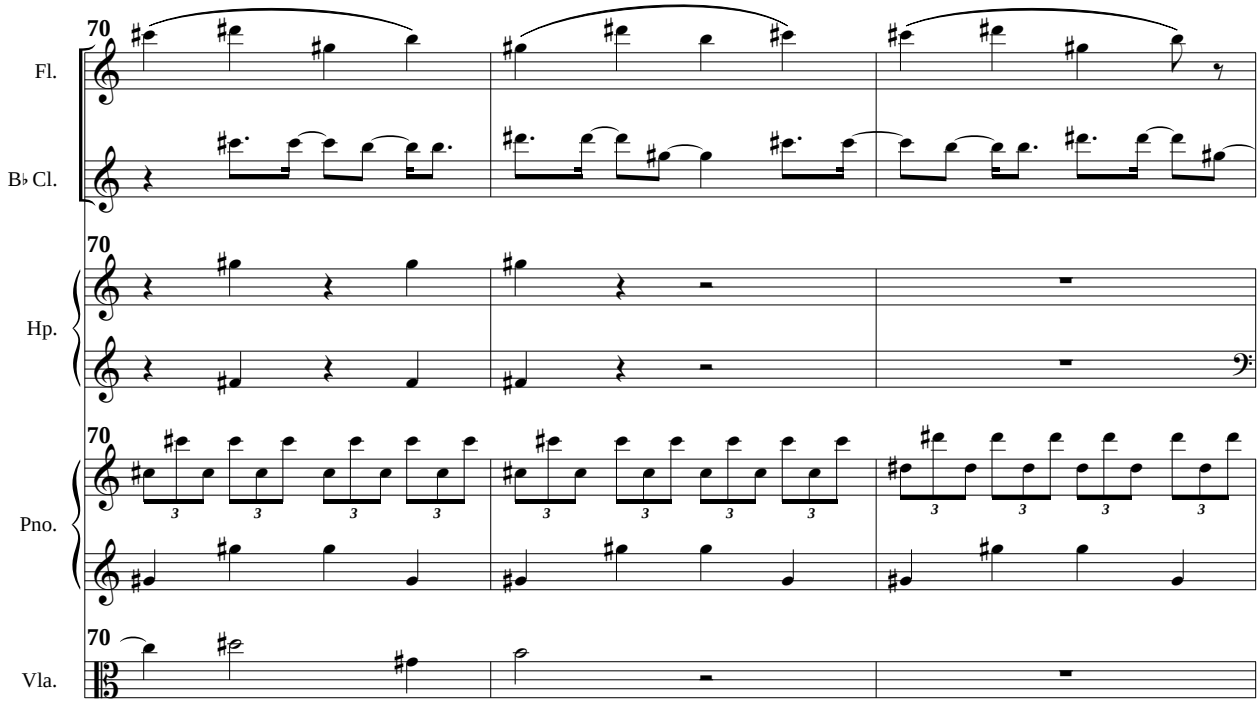
B♭ Cl.
mp
mp
58
Hp.
58
Pno.
58
Vla.


61
Fl.
B♭ Cl.
61
Hp.
mf
61
Pno.
61
Vla.


64
Fl.
B♭ Cl.
Hp.
Pno.
Vla.


67
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mf


70
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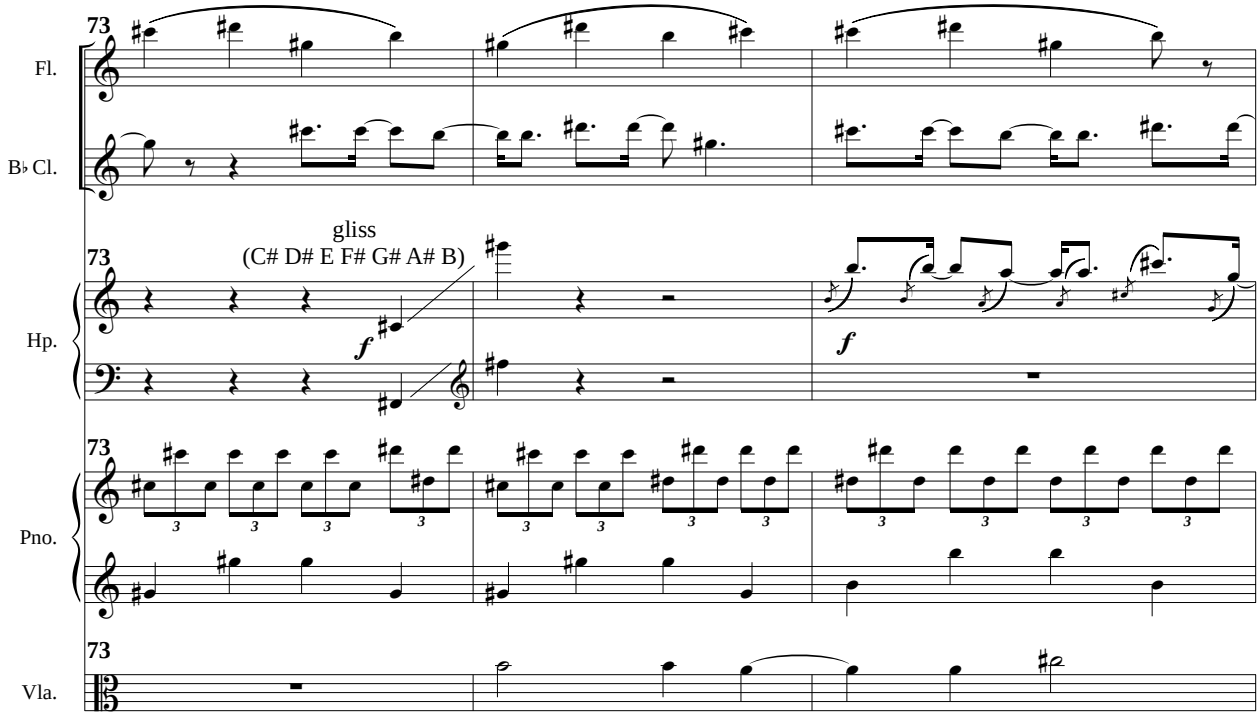
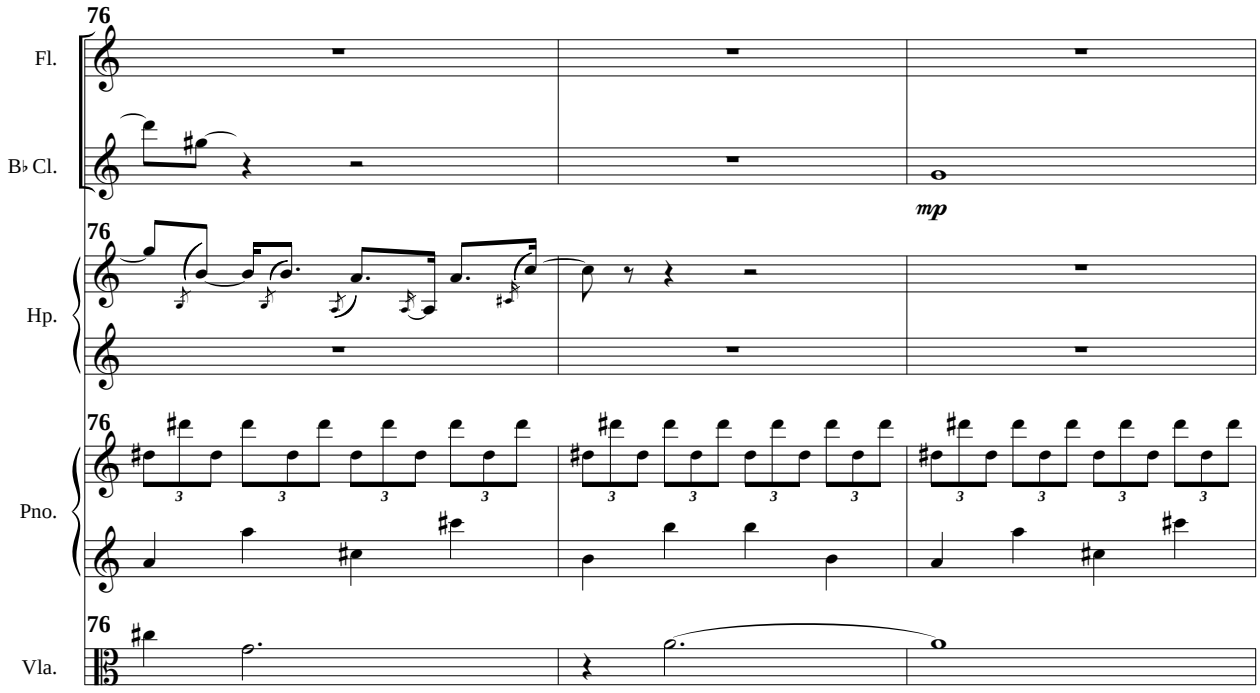
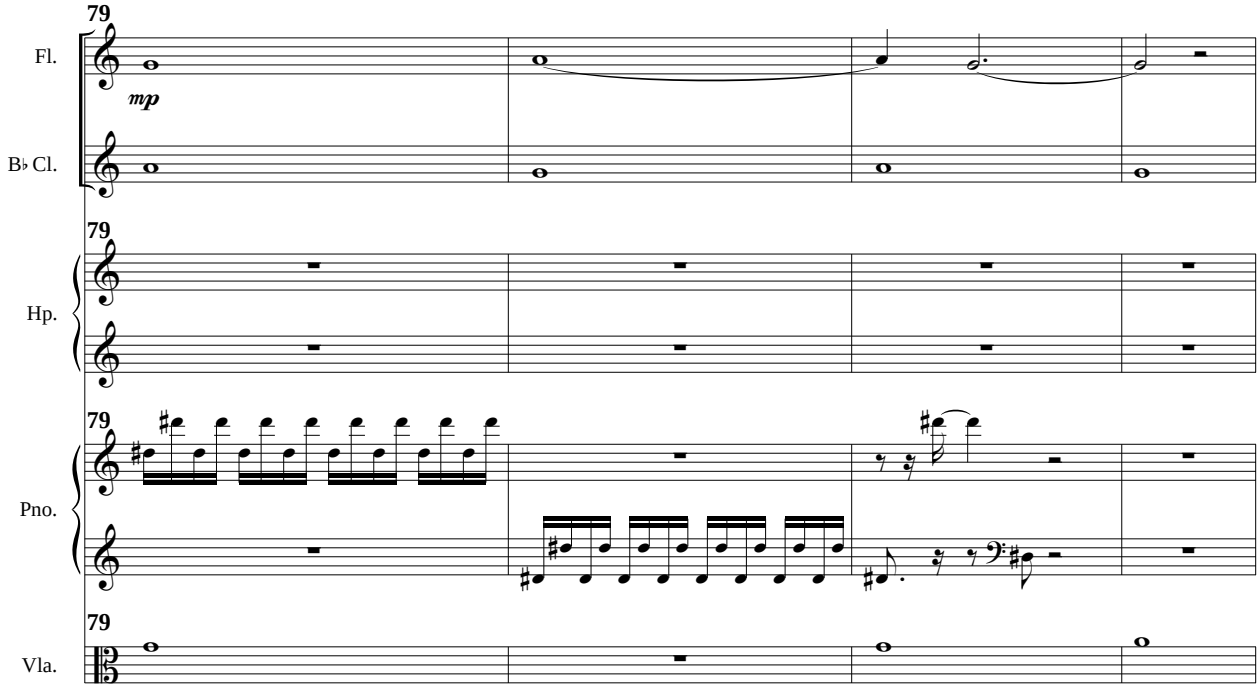
Vla.


73
Fl.
B♭ Cl.
gliss
(C# D# E F# G# A# B)
f
Hp.
Pno.
Vla.


76
Fl.
B♭ Cl.
mp
76
Hp.
76
Pno.
3
76
Vla.


79
Fl.
mp
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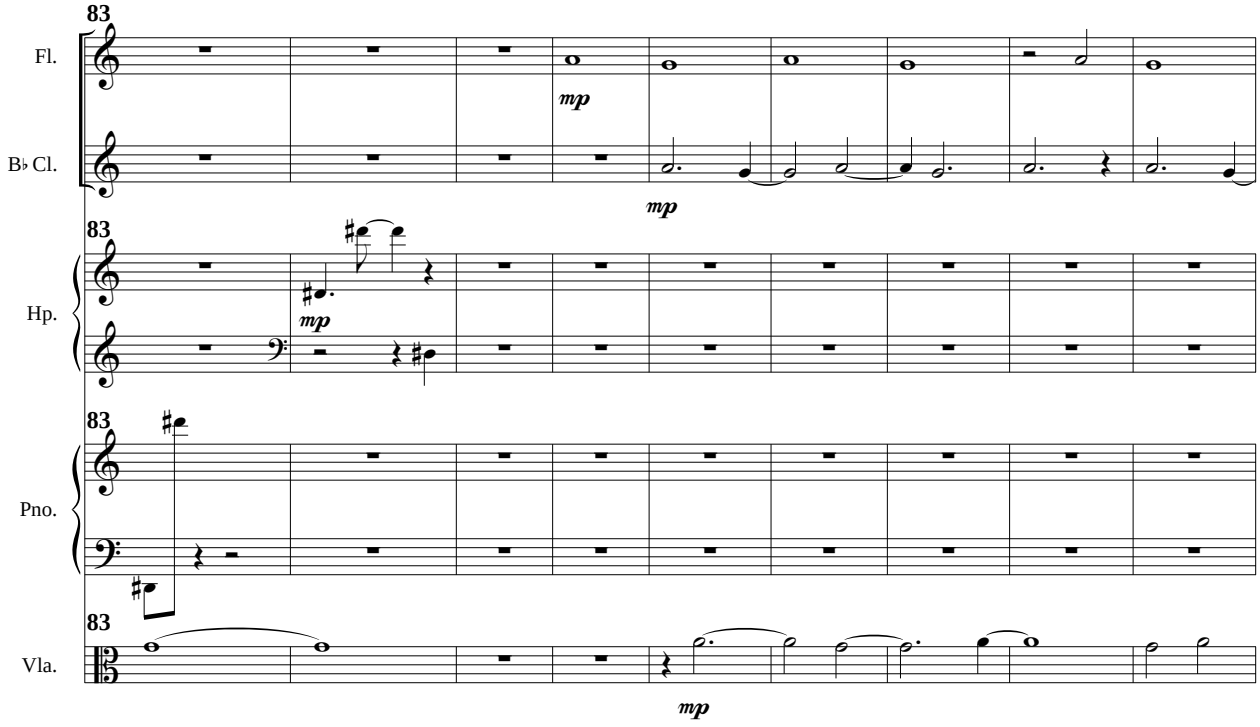
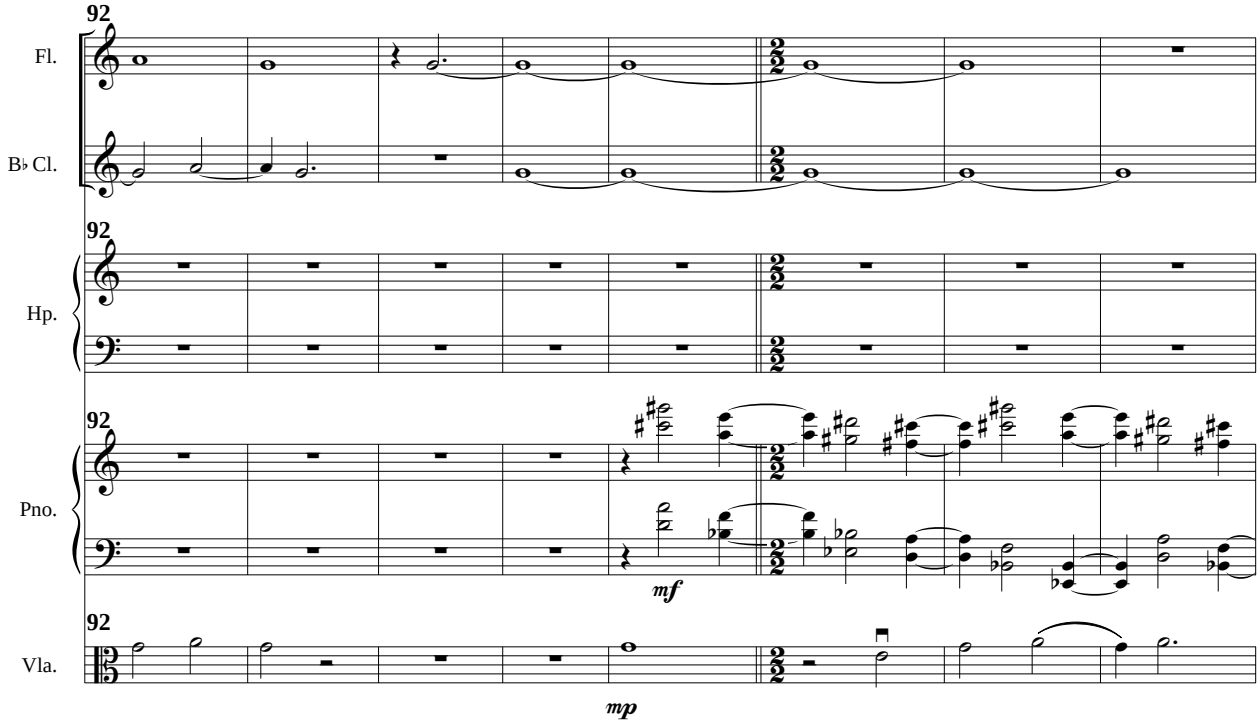
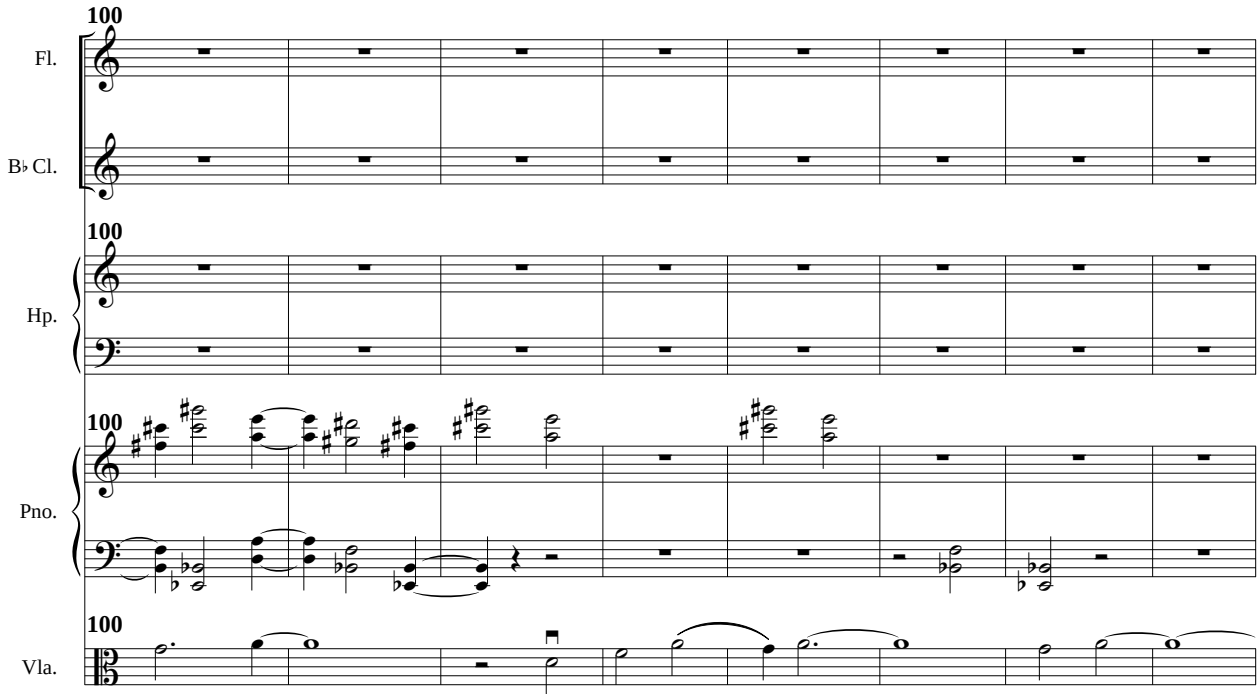
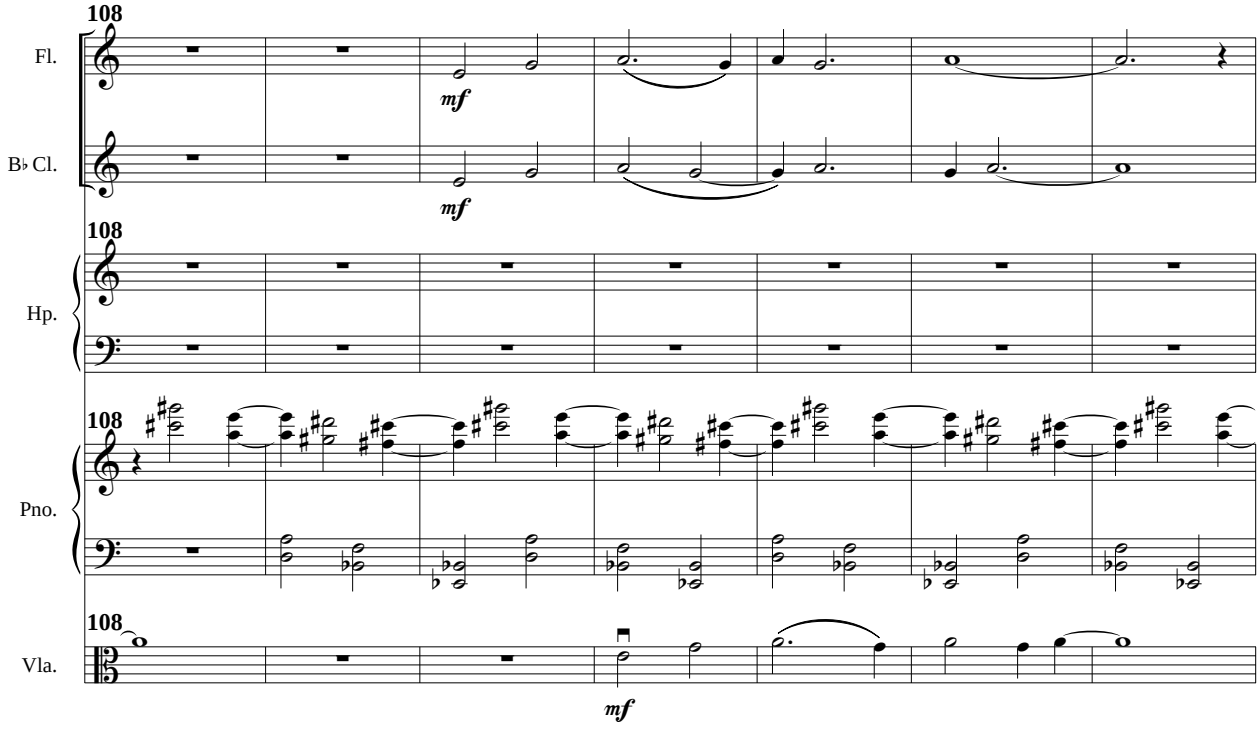
79
Hp.
79
Pno.
79
Vla.


83
Fl.
mp
B♭ Cl.
mp
83
Hp.
mp
83
Pno.
83
Vla.
mp


92
Fl.
B♭ Cl.
92
Hp.
92
Pno.
mf
92
Vla.
mp


100
Fl.
B♭ Cl.
100
Hp.
100
Pno.
100
Vla.


108
Fl.
mf
B♭ Cl.
mf
108
Hp.
108
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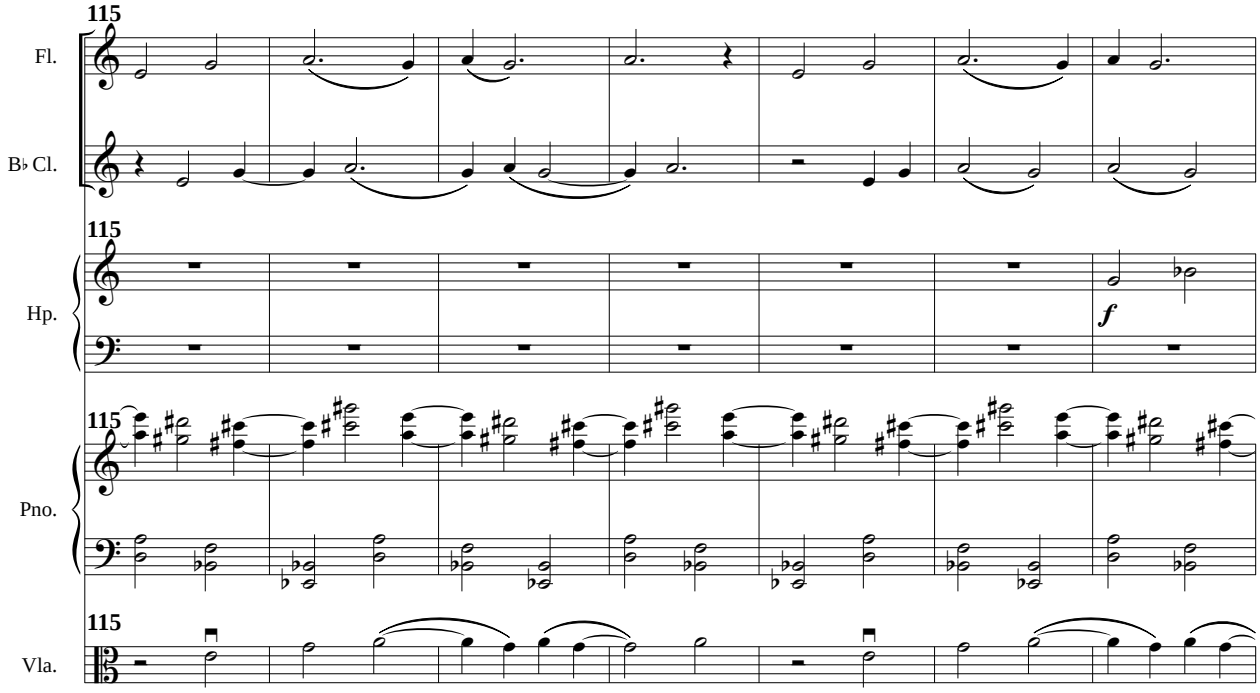
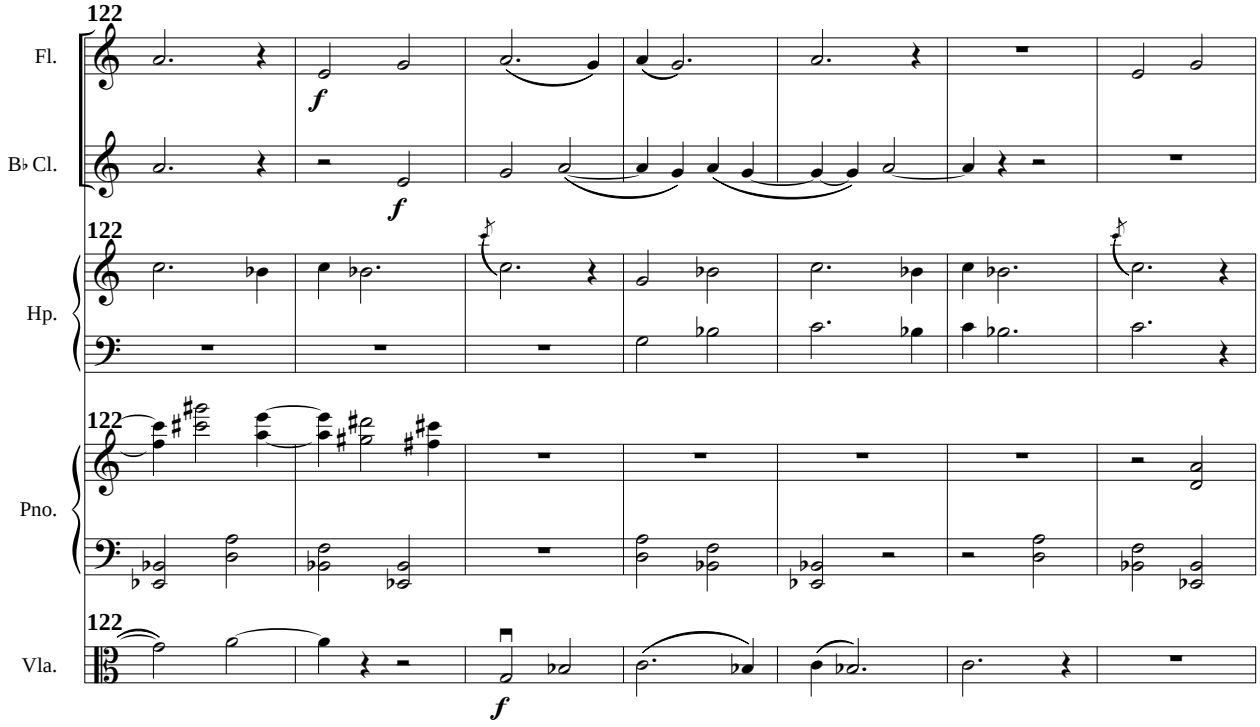
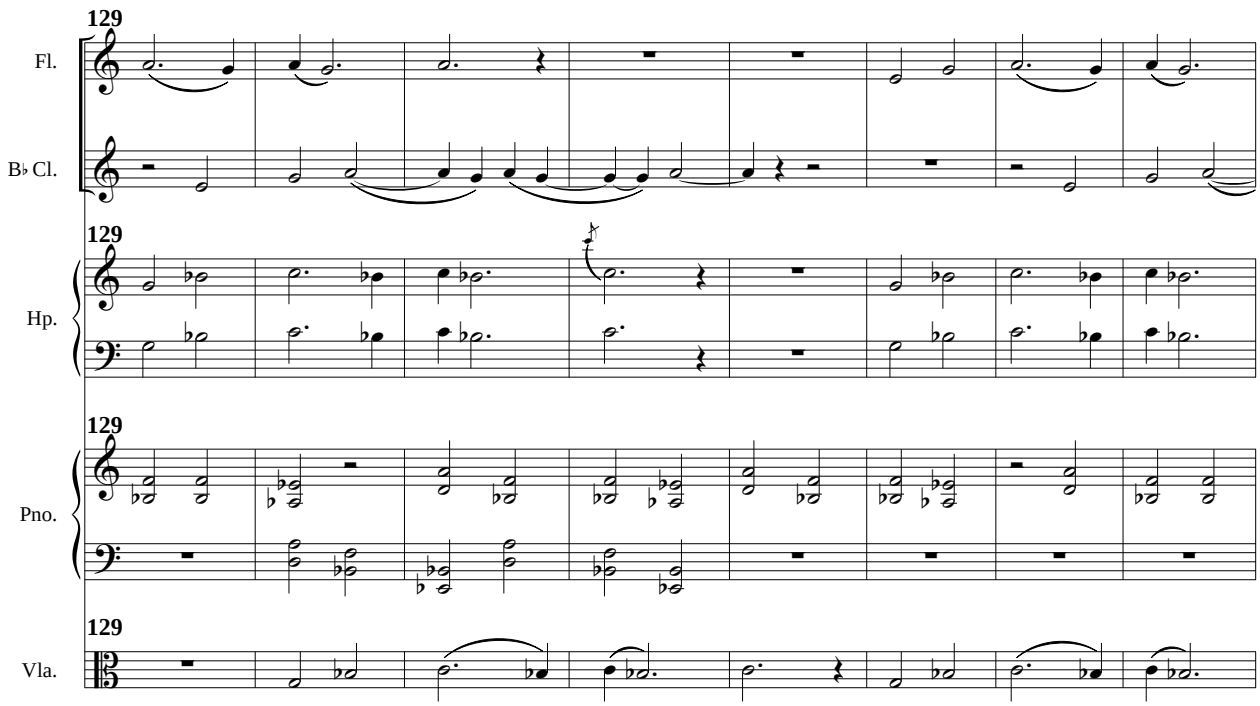
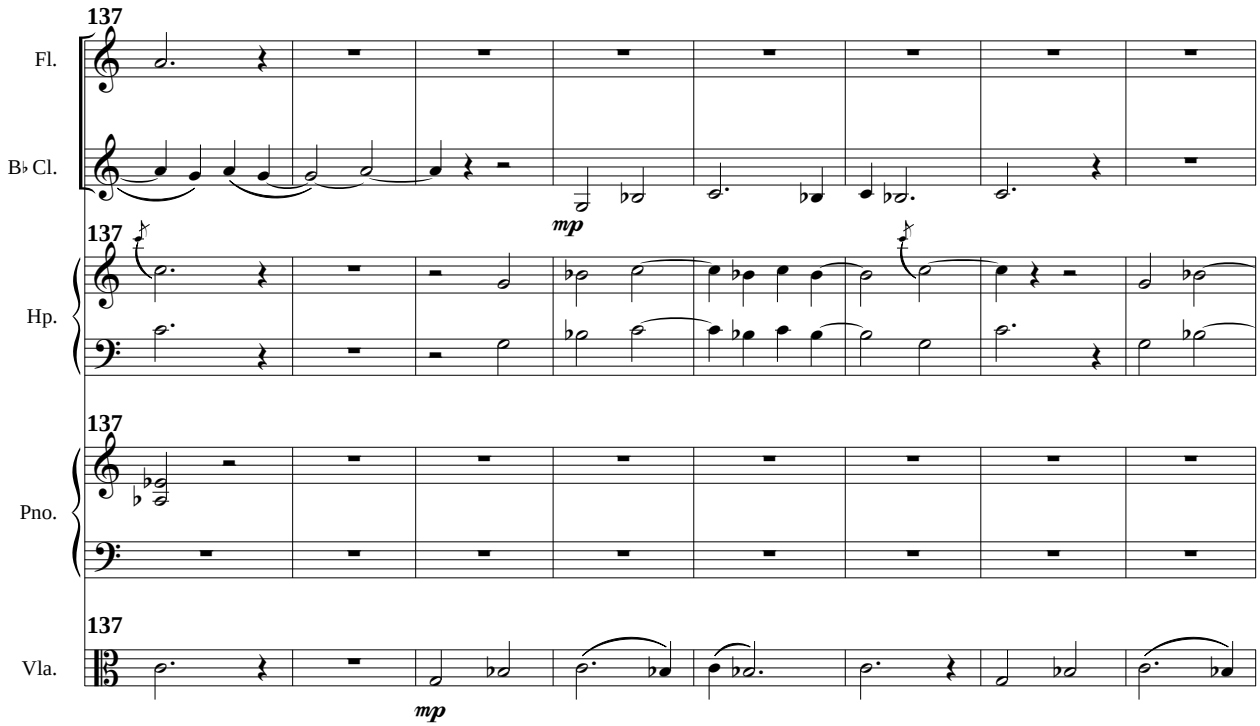
108
Vla.
mf


115
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
f


122
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
f


129
Fl.
B♭ Cl.
129
Hp.
129
Pno.
129
Vla.


137
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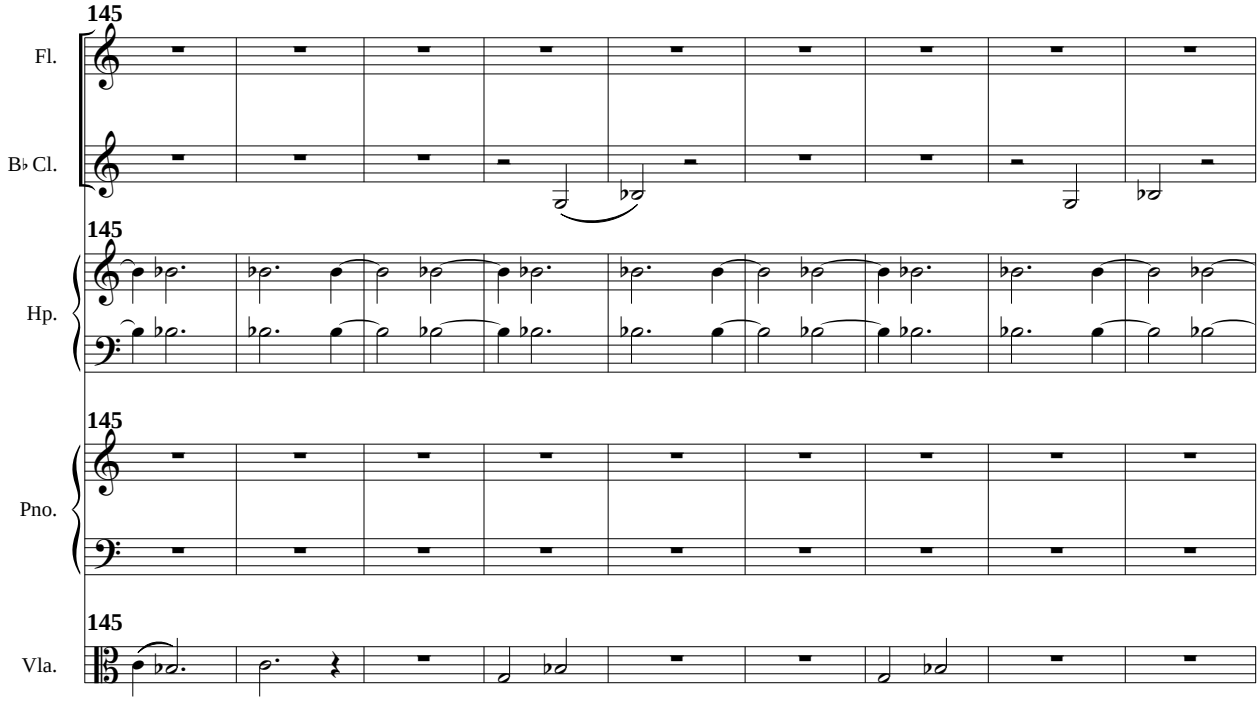
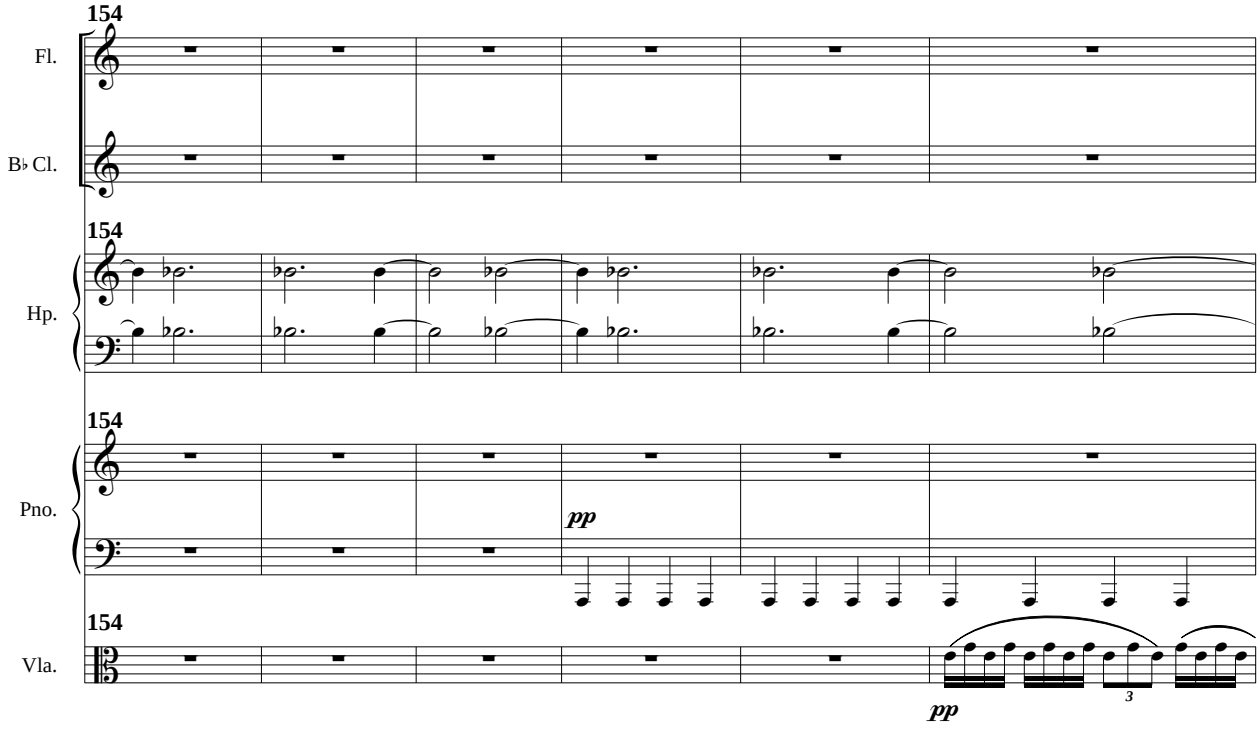
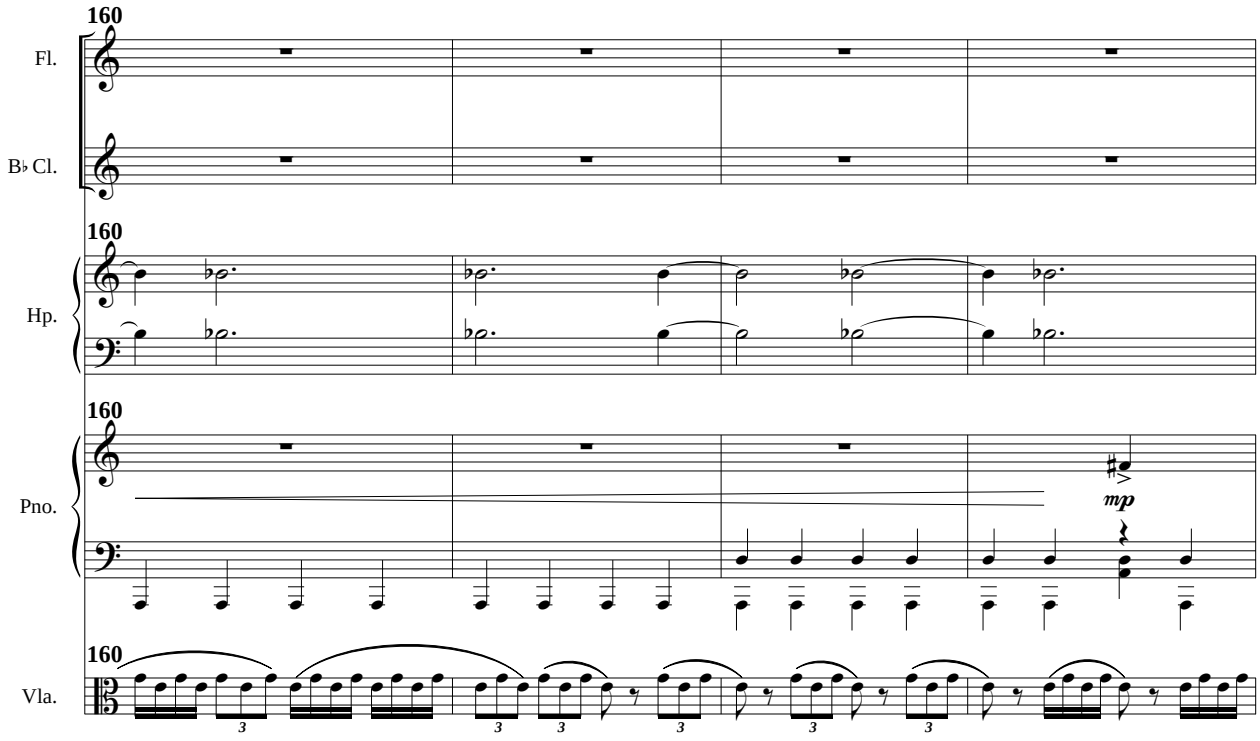
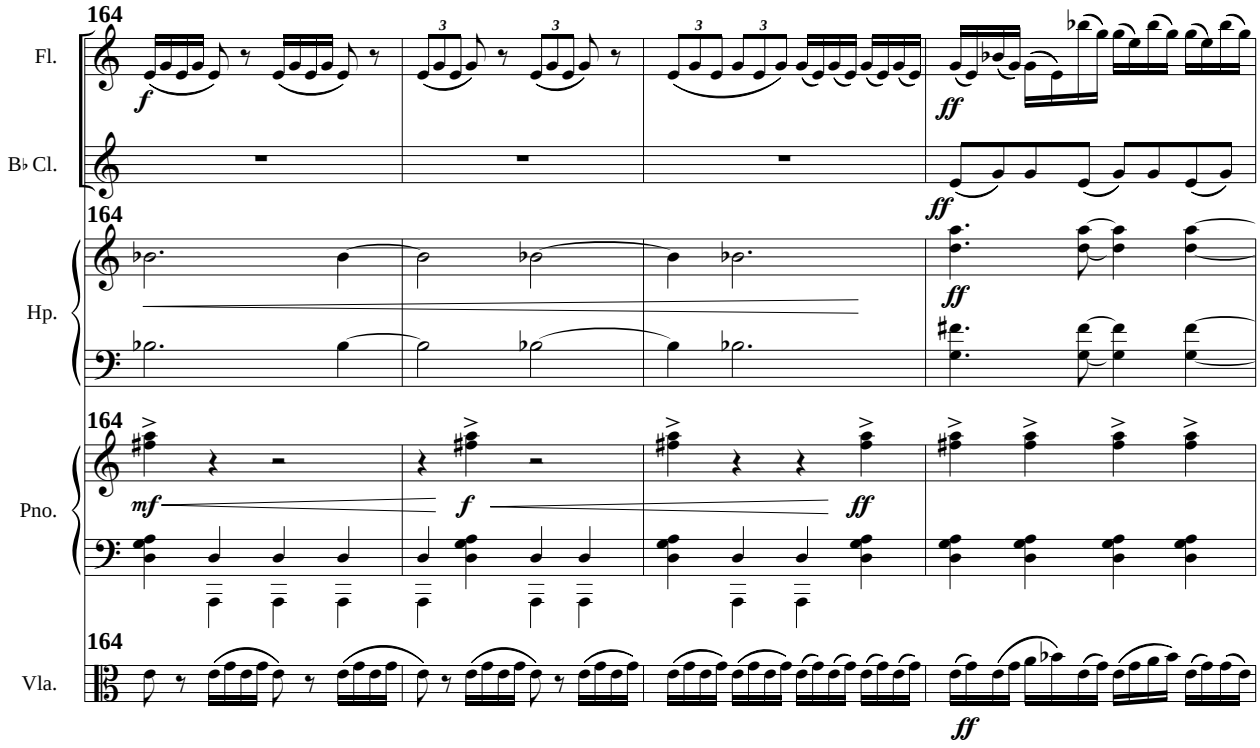
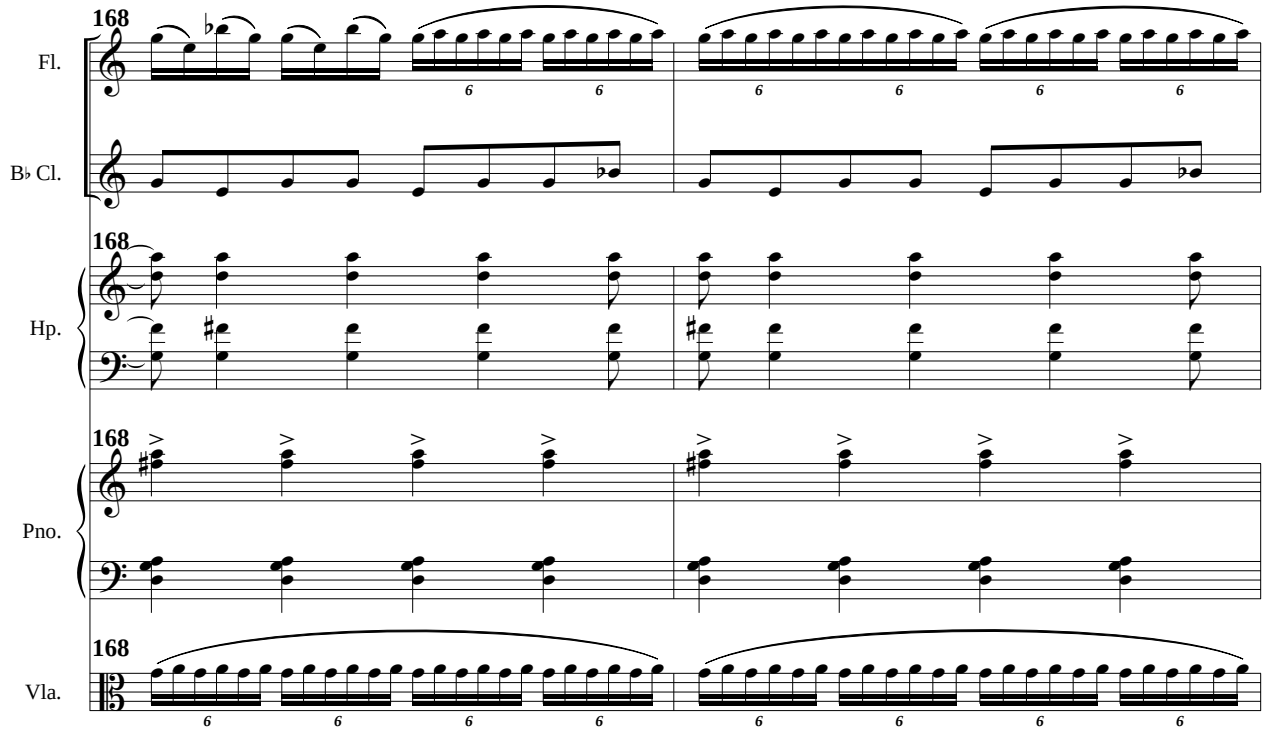
B♭ Cl.
mp
137
Hp.
137
Pno.
137
Vla.
mp

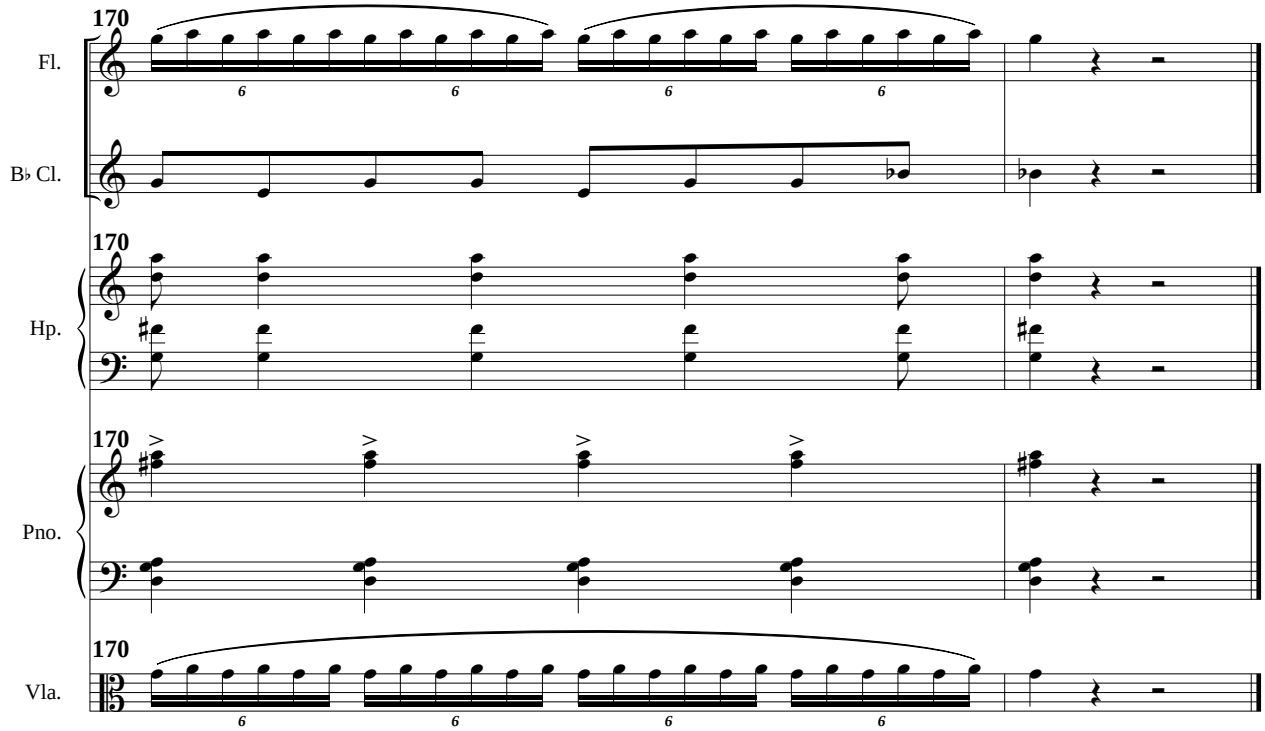

145
Fl.
B♭ Cl.
145
Hp.
145
Pno.
145
Vla.


154
Fl.
B♭ Cl.
154
Hp.
154
Pno.
pp
154
Vla.
pp
3

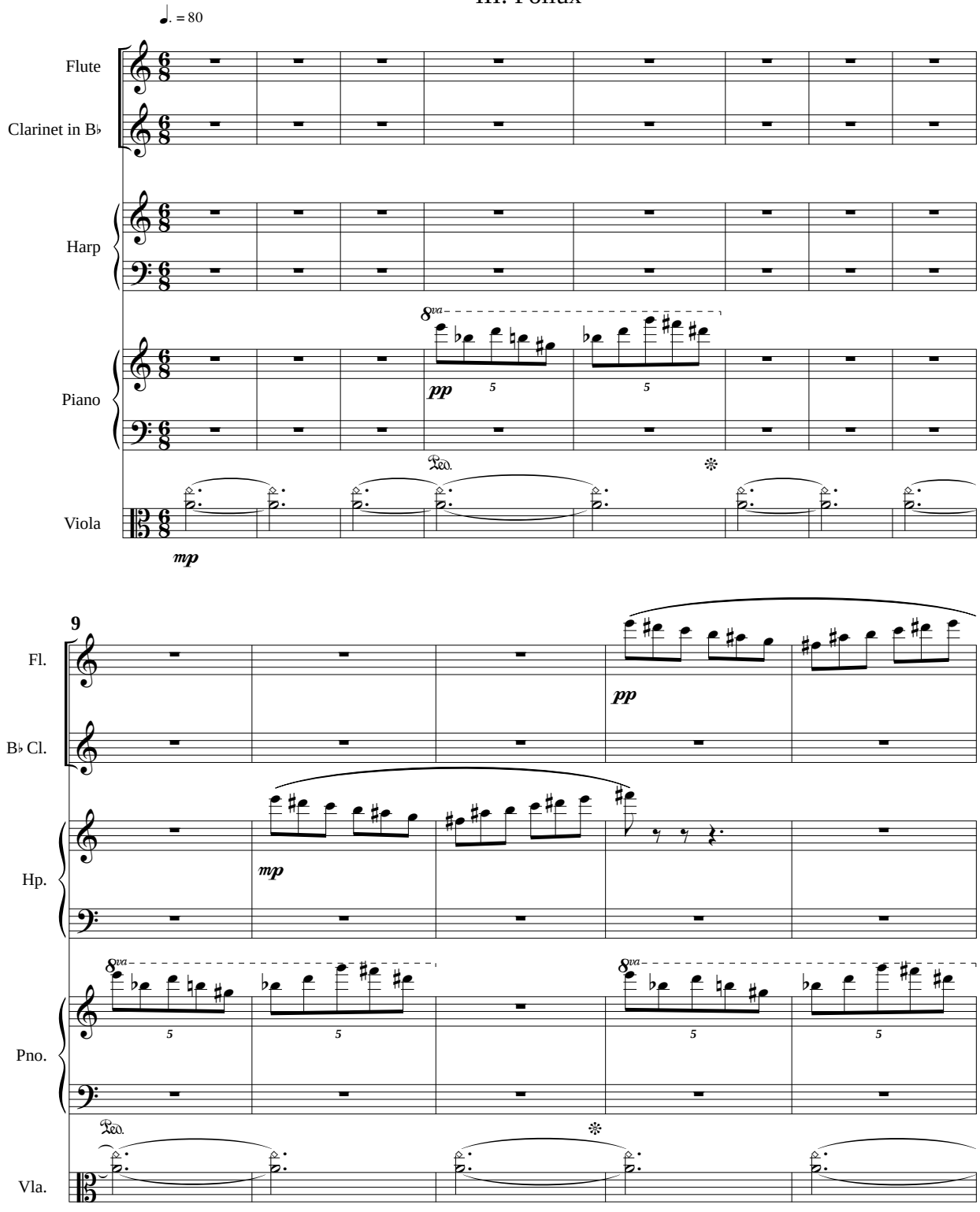

160
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp

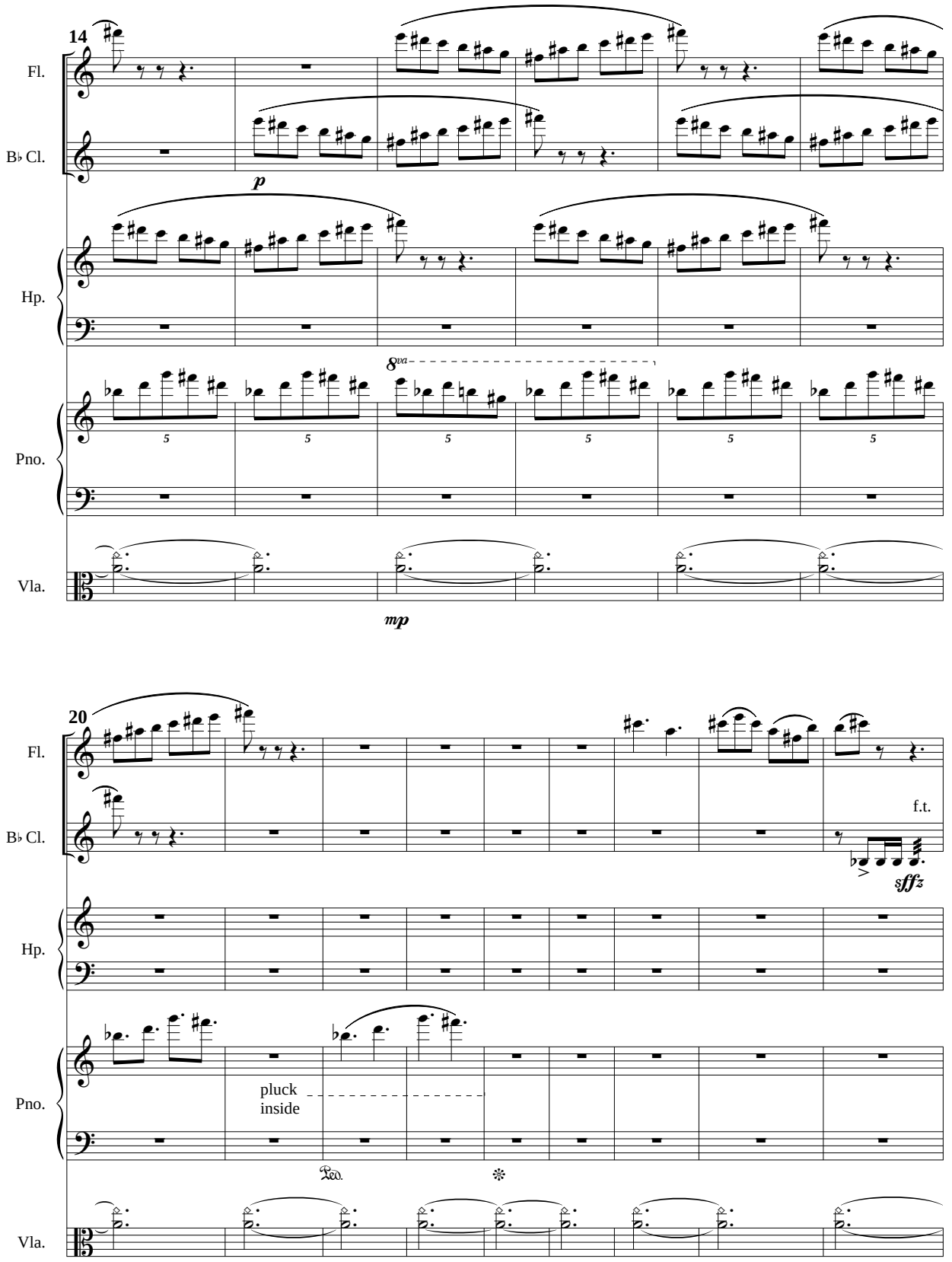

164
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
f
ff
mf

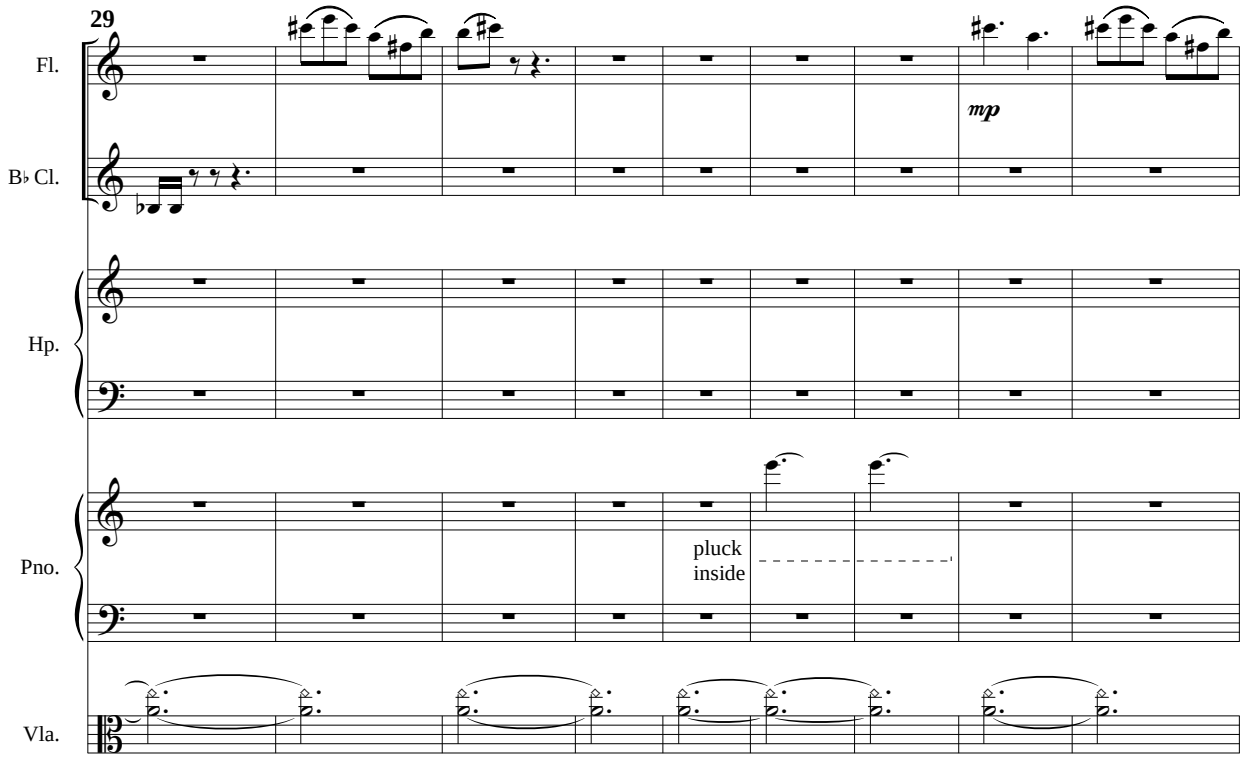

168
Fl.
B♭ Cl.
Hp.
Pno.
Vla.

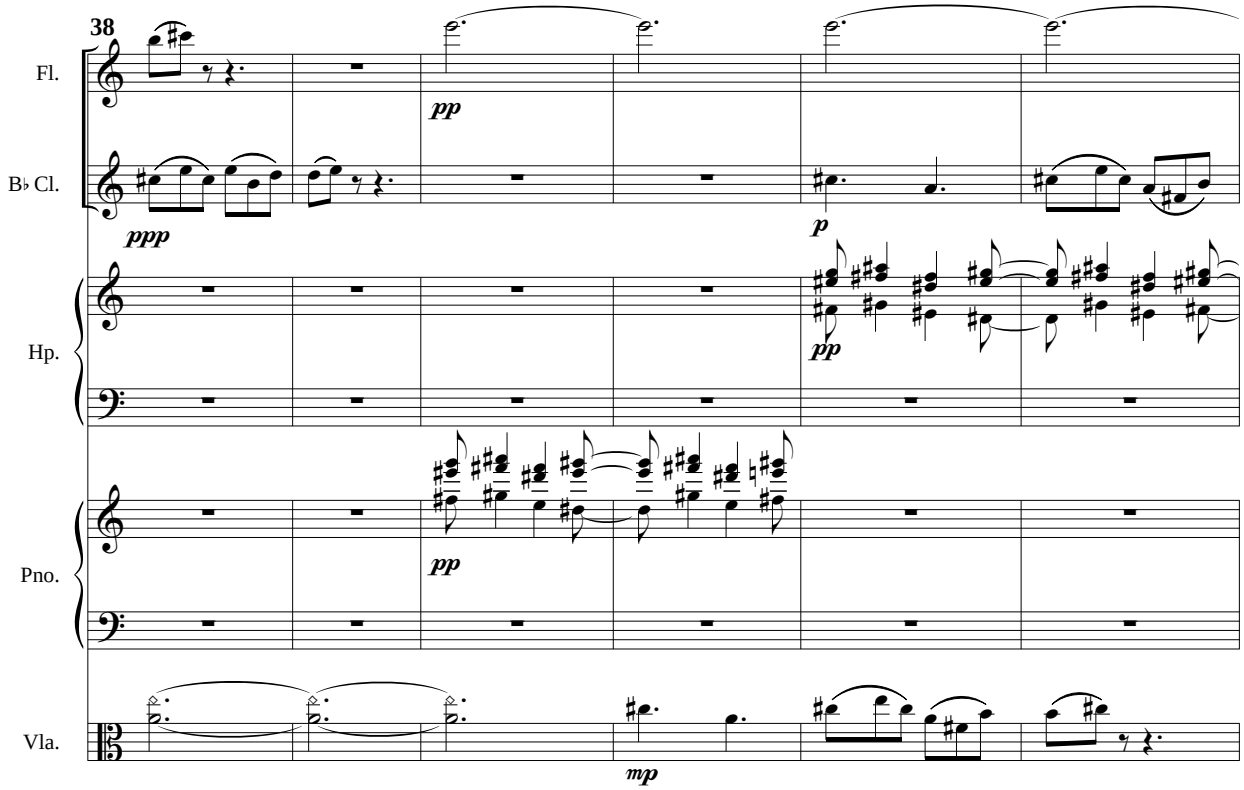

170
Fl.
B♭ Cl.
Hp.
Pno.
Vla.

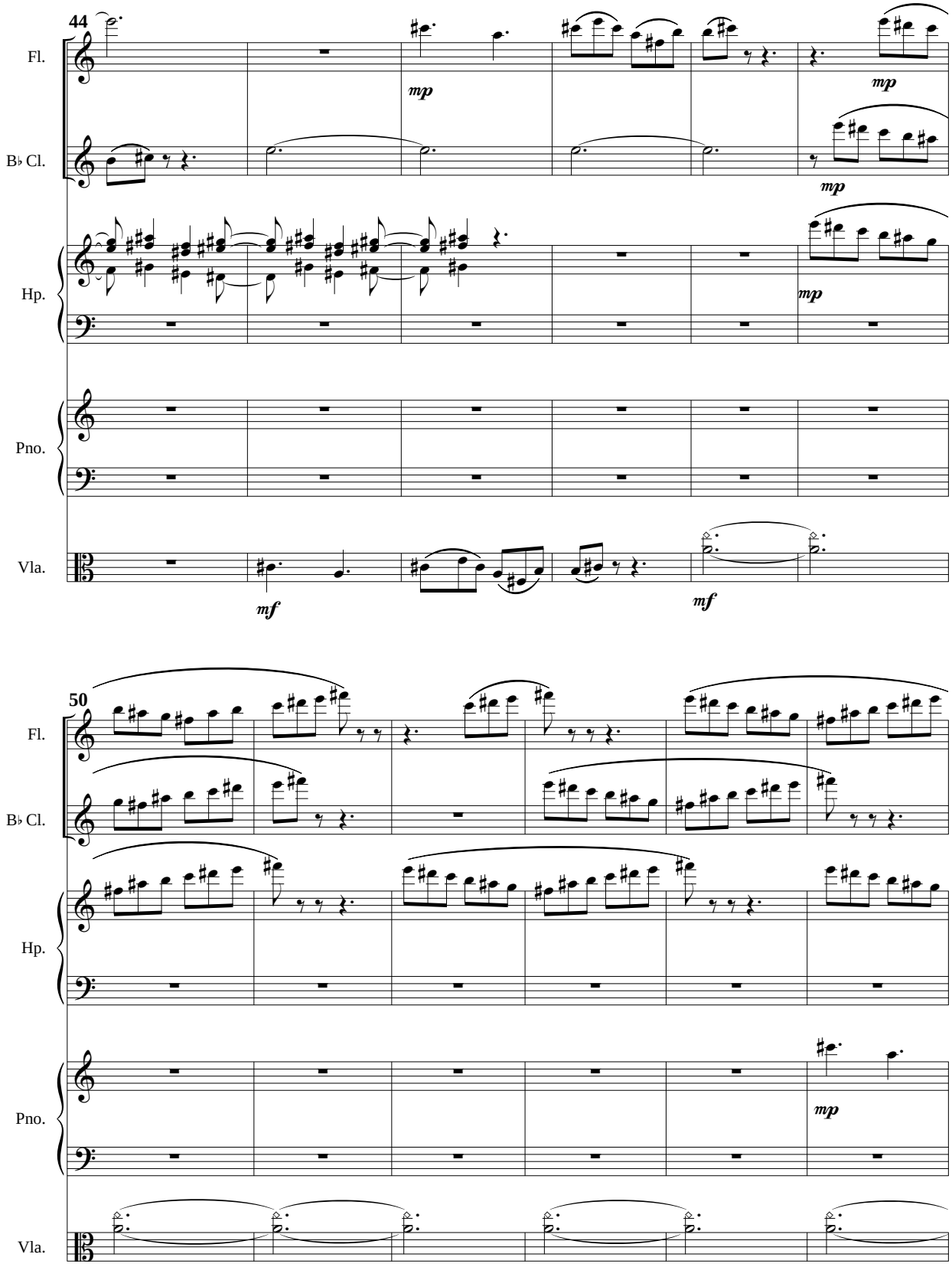
III: Pollux

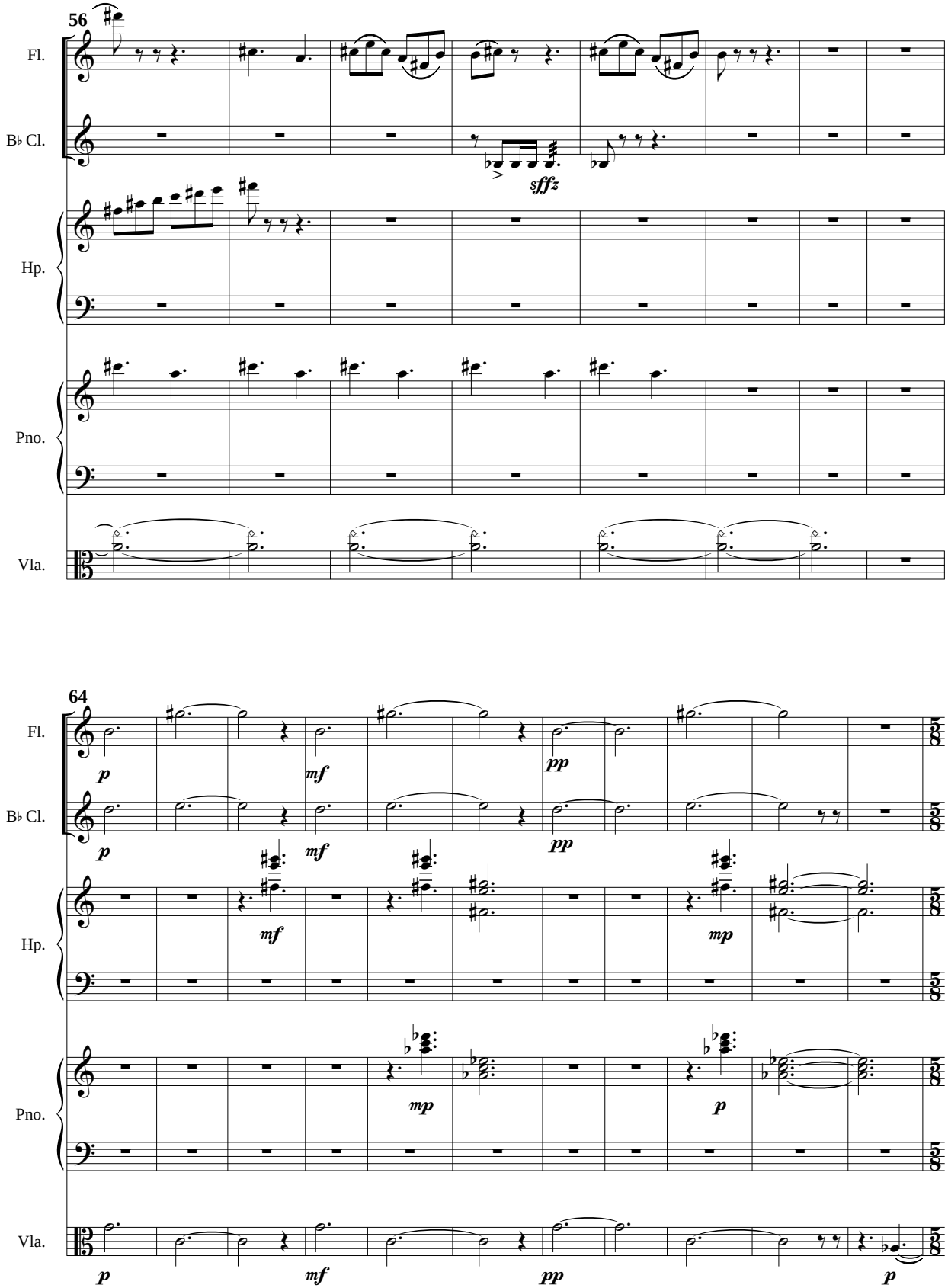

♩. = 80
Flute
Clarinet in B♭
Harp
Piano
Viola
8va
pp
5
Ped.
mp
9
Fl.
B♭ Cl.
Hp.
Pno.
Vla.

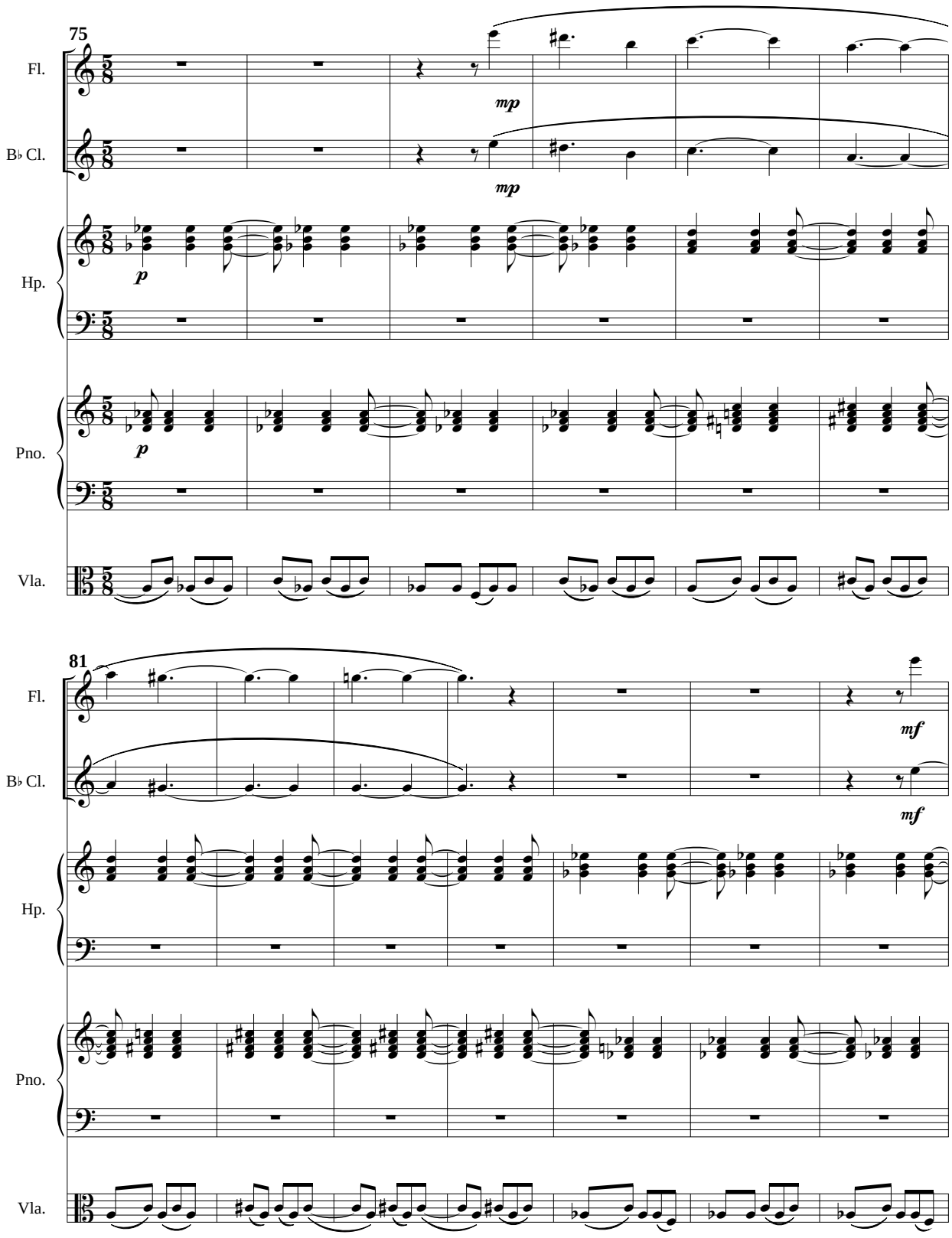

14
Fl.
B♭ Cl.
p
Hp.
8va
Pno.
5
Vla.
mp
20
Fl.
B♭ Cl.
f.t.
sffz
Hp.
Pno.
pluck
inside
Vla.

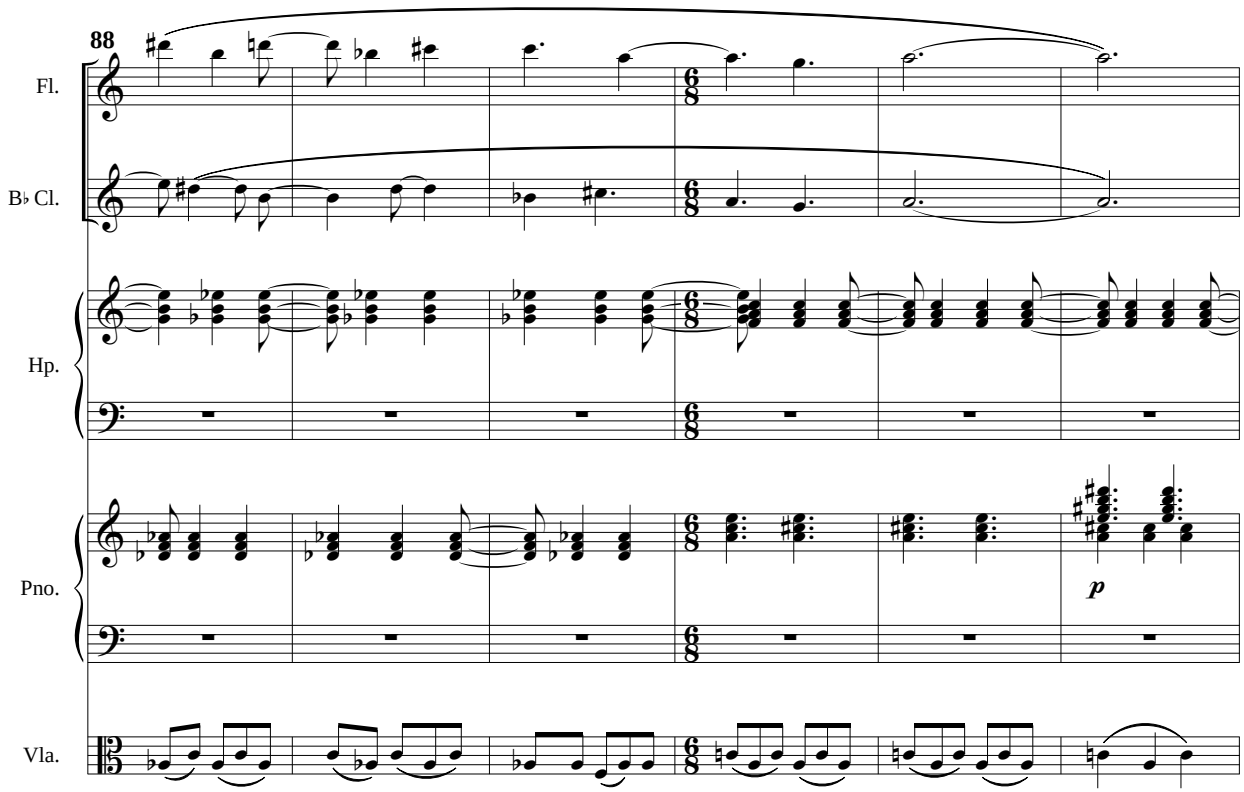

29
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp
pluck
inside

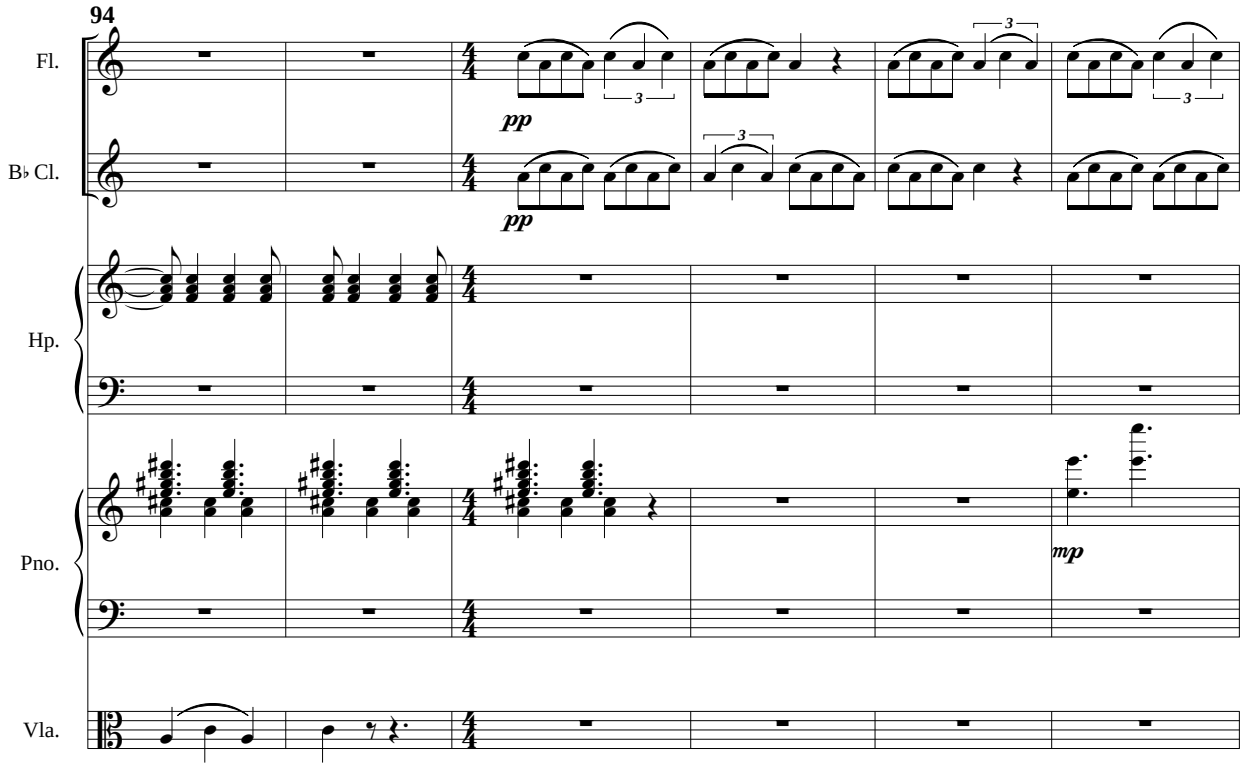

38
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp
ppp
p
pp
pp
mp

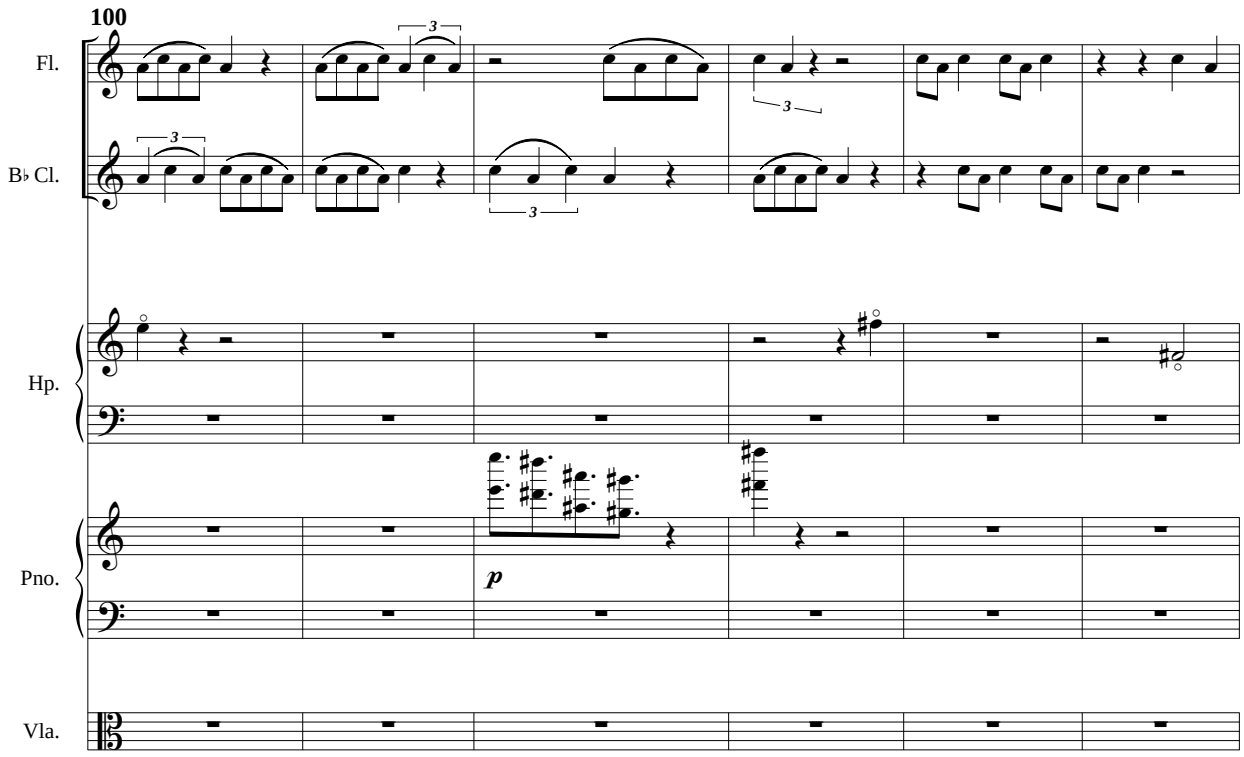

44
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp
mf
50

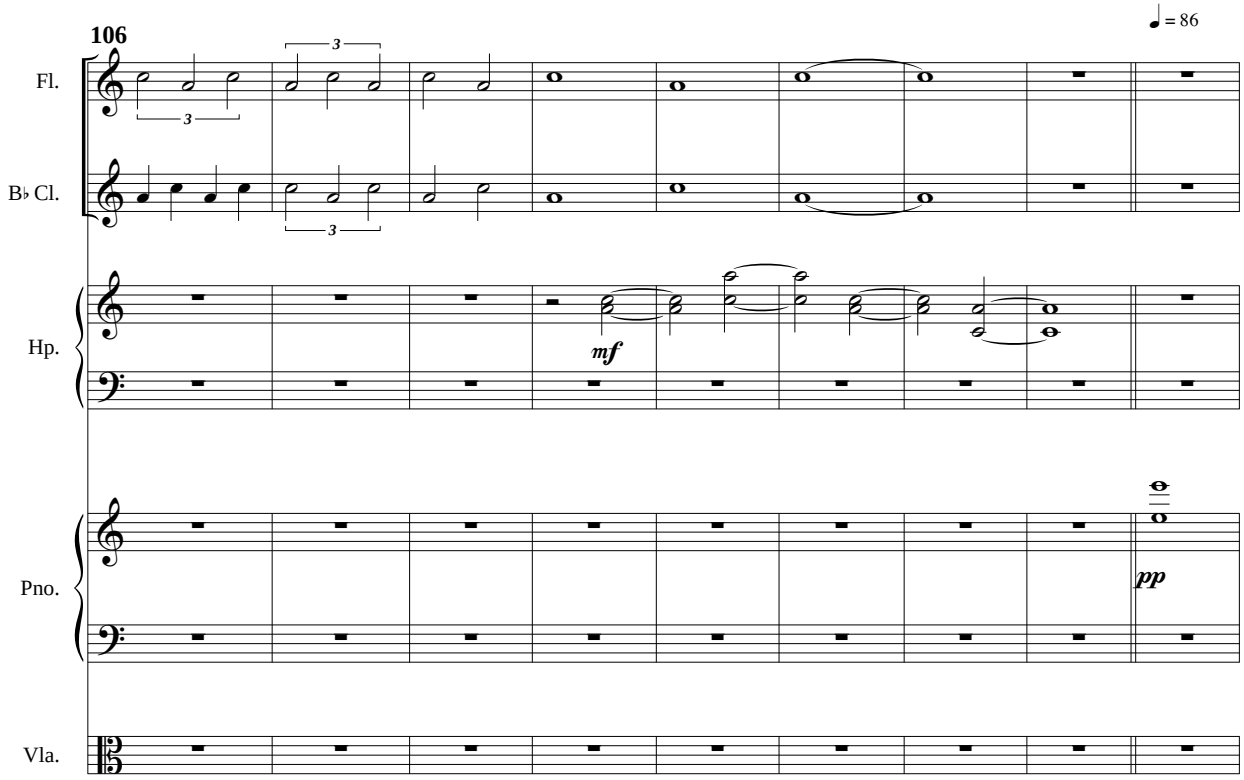

56
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
sffz
64
p
mf
pp
mp

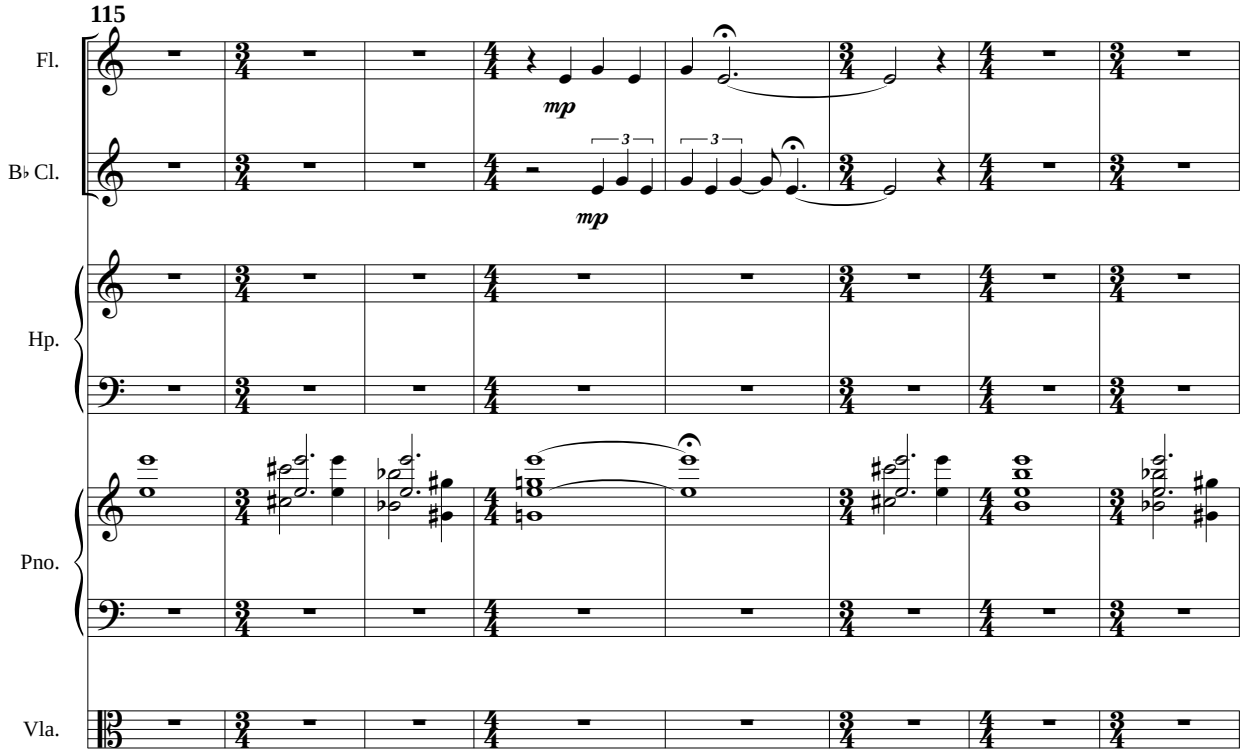

75
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp
mp
p
p
81
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mf
mf

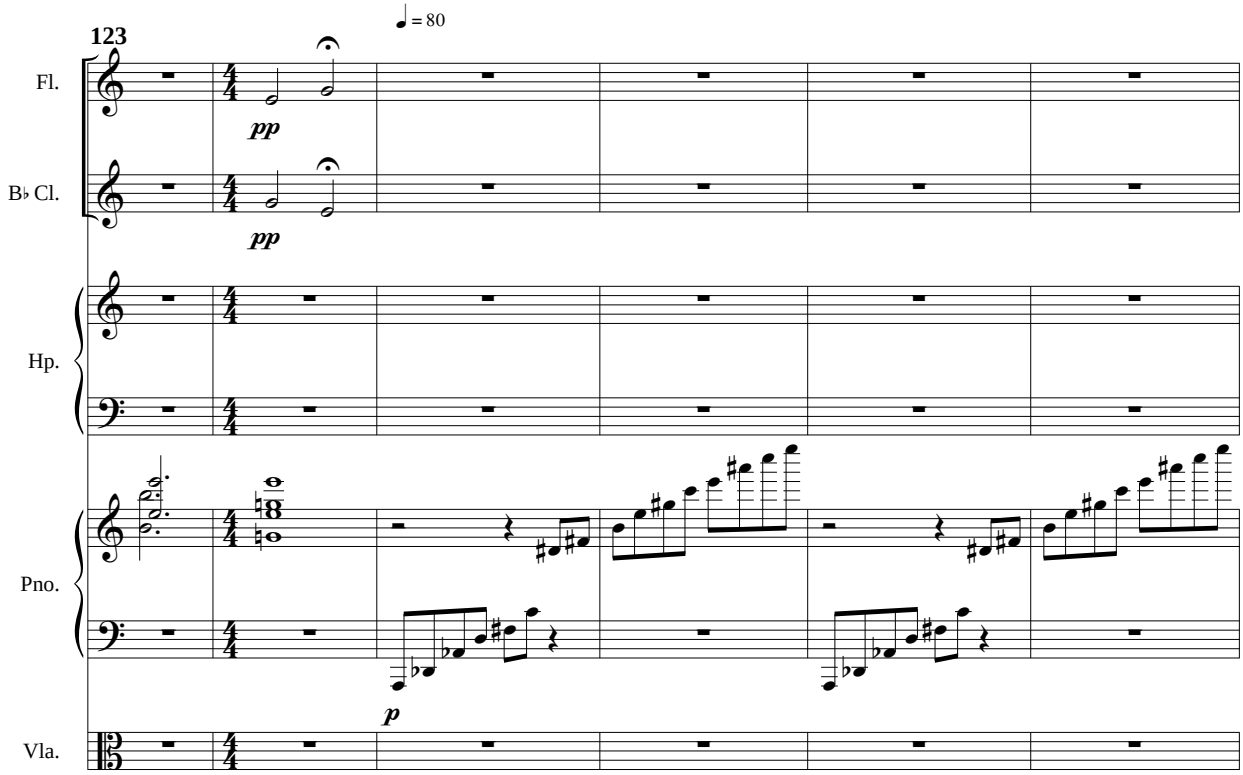

88
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
p

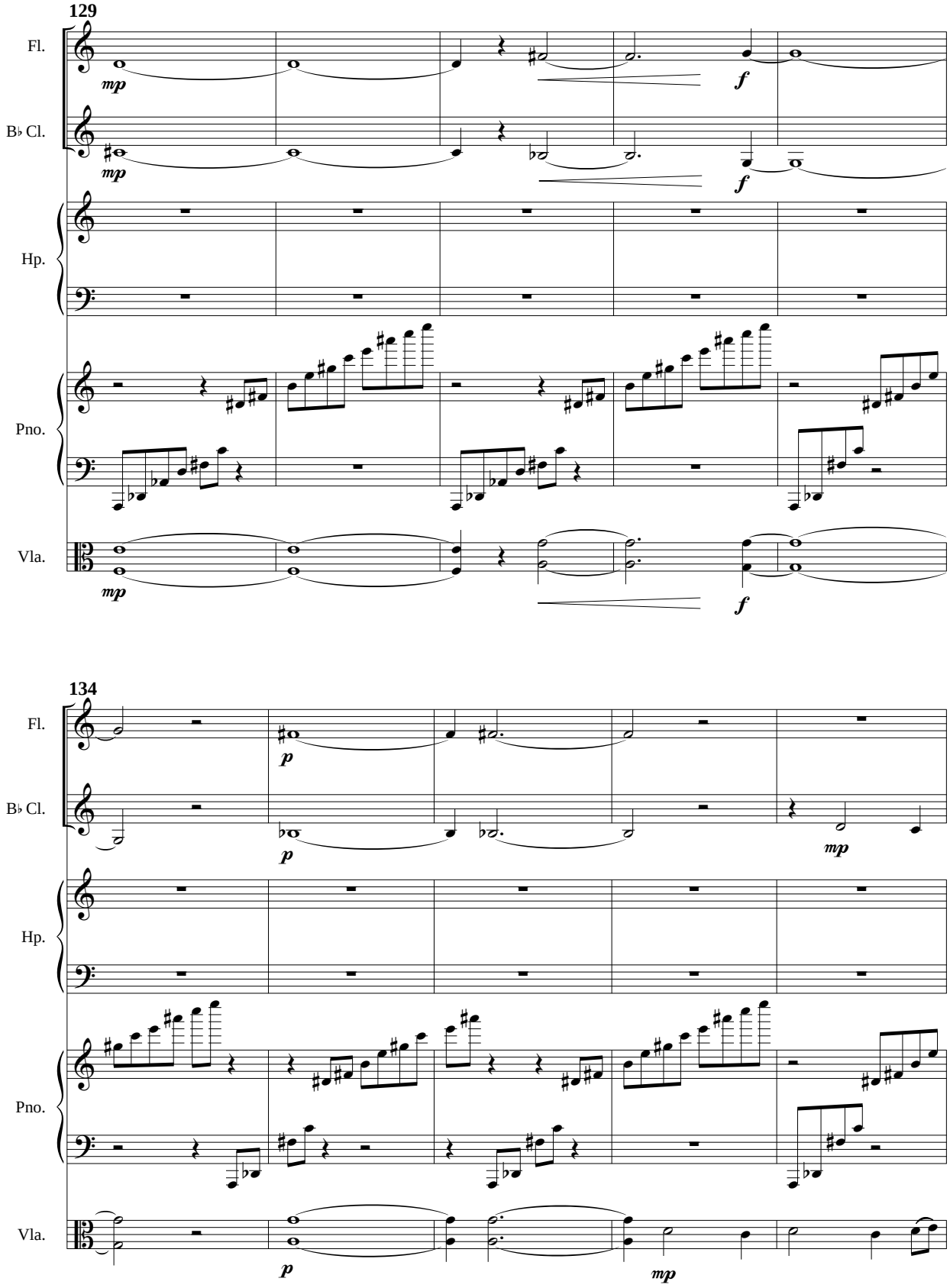

94
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp
pp
mp
3

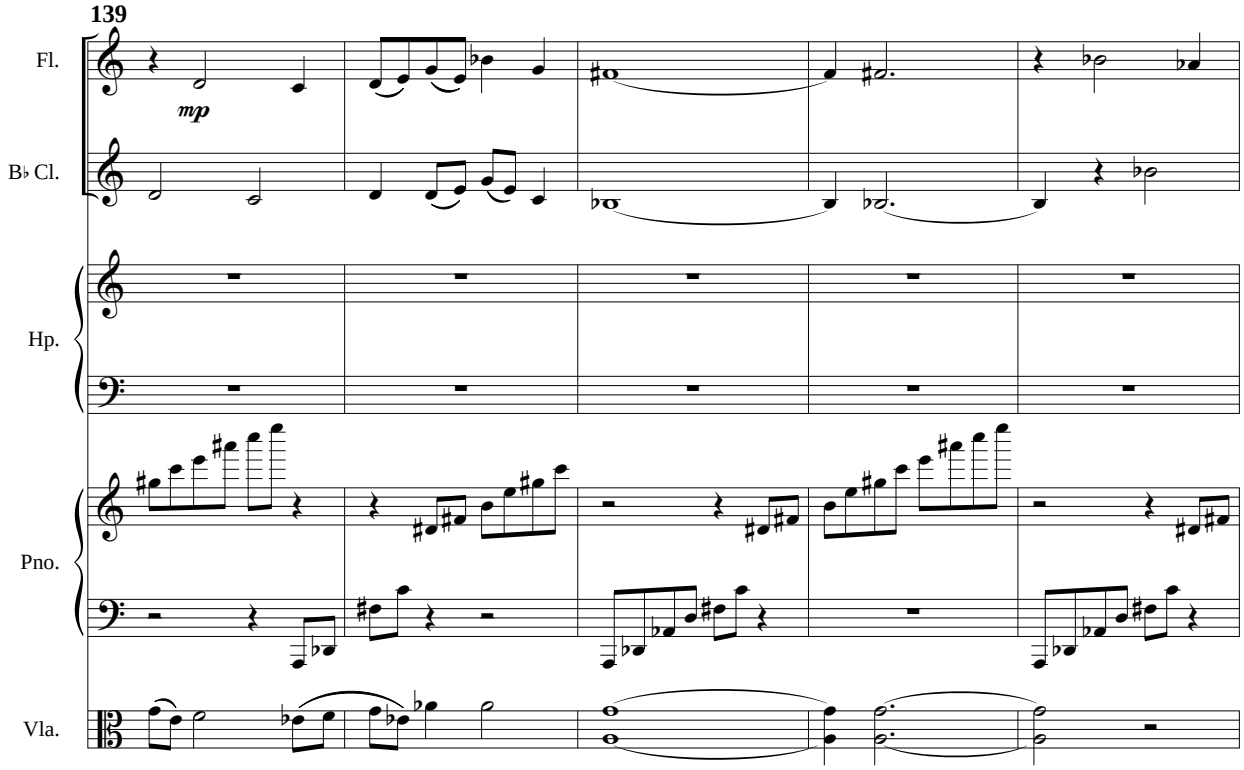

100
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
p

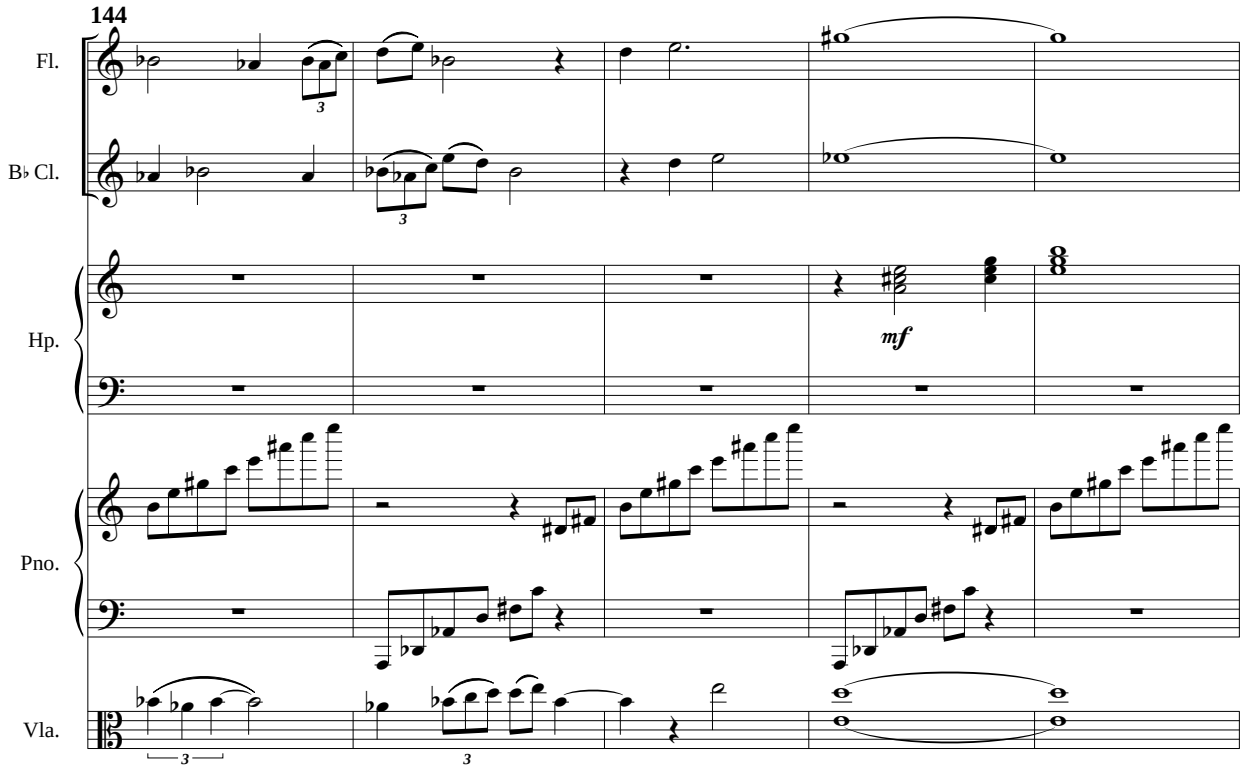

106
♩ = 86
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mf
pp

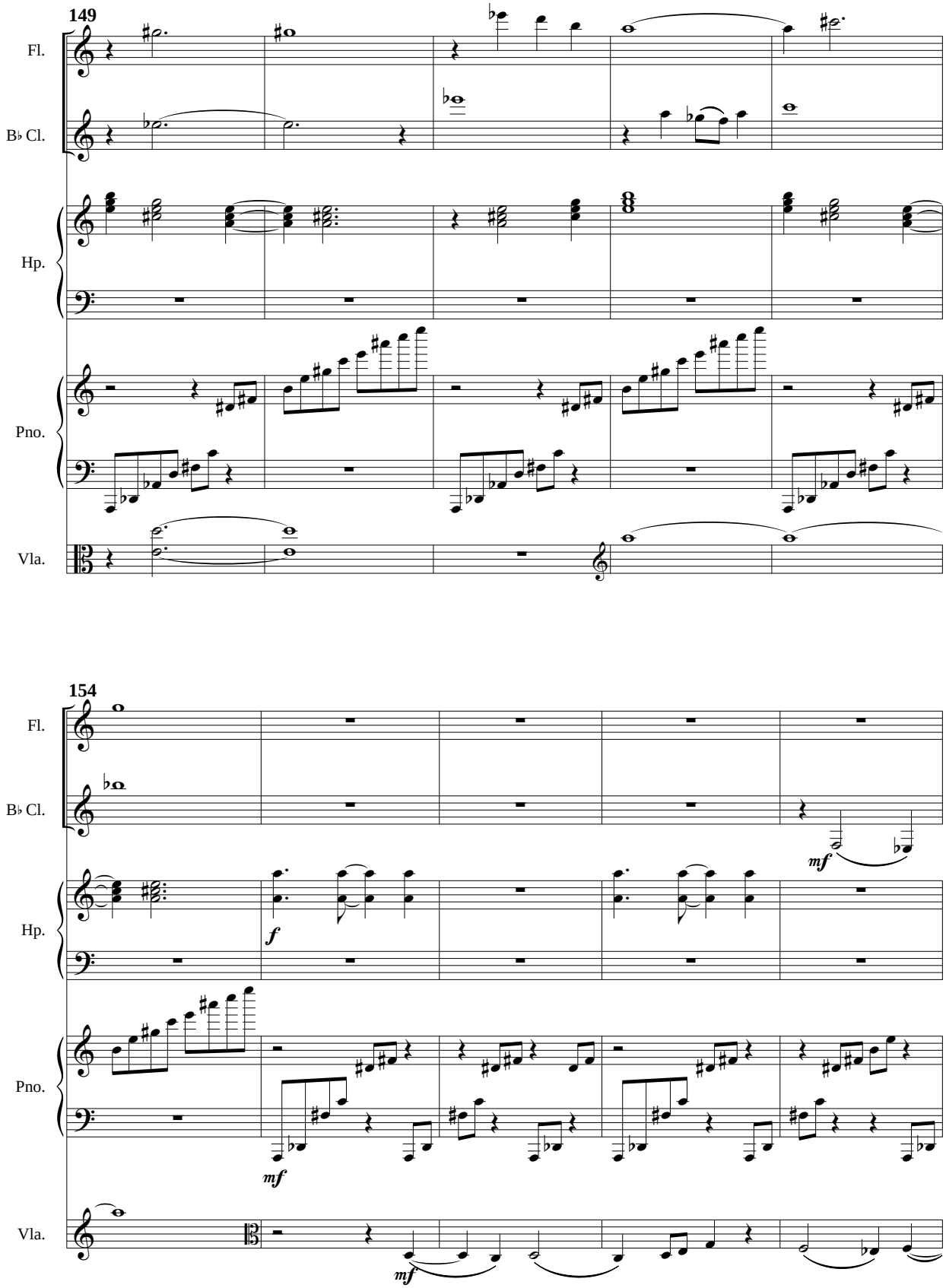

115
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp
mp
3
3

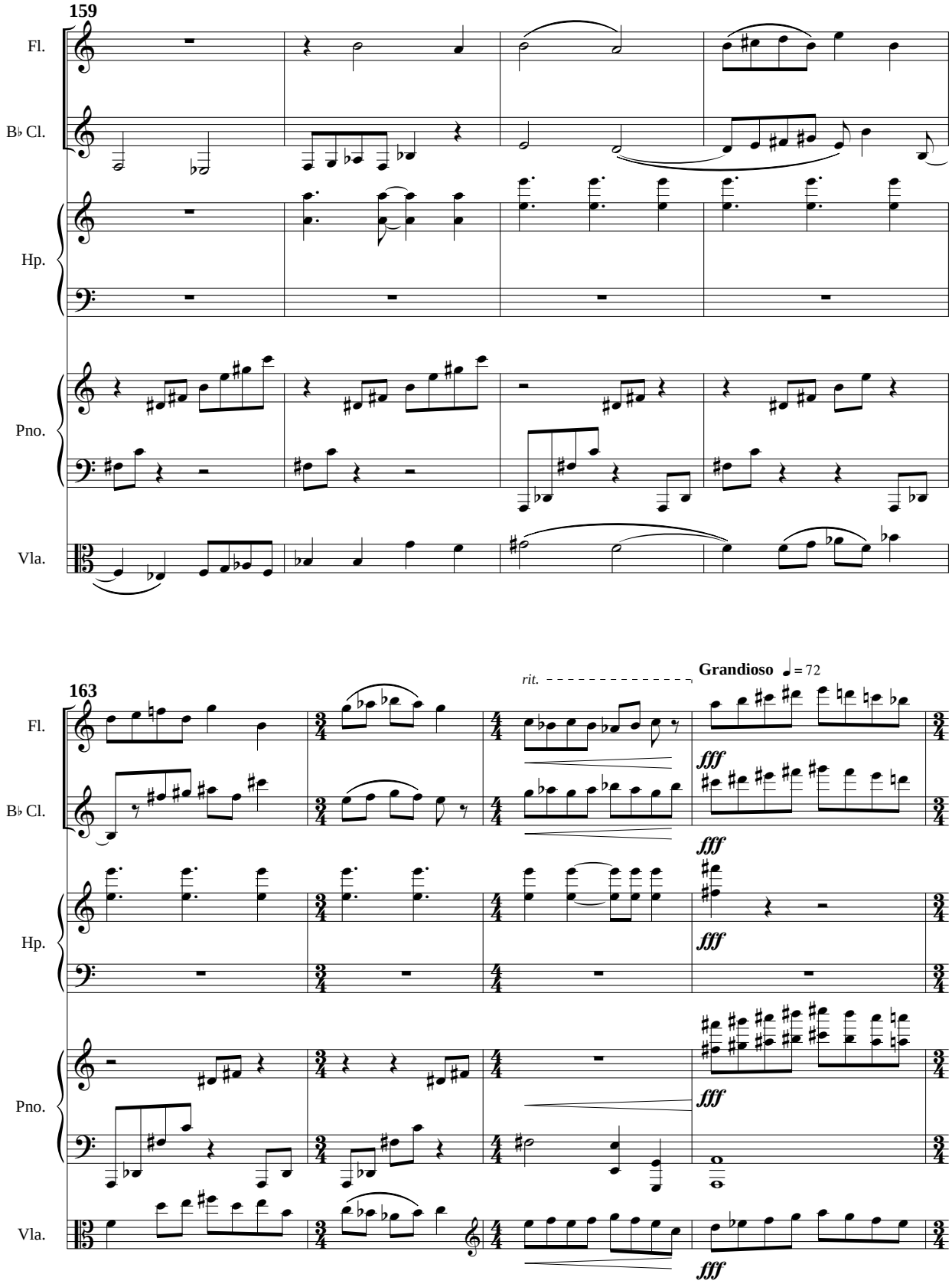

123
♩ = 80
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp
pp
p

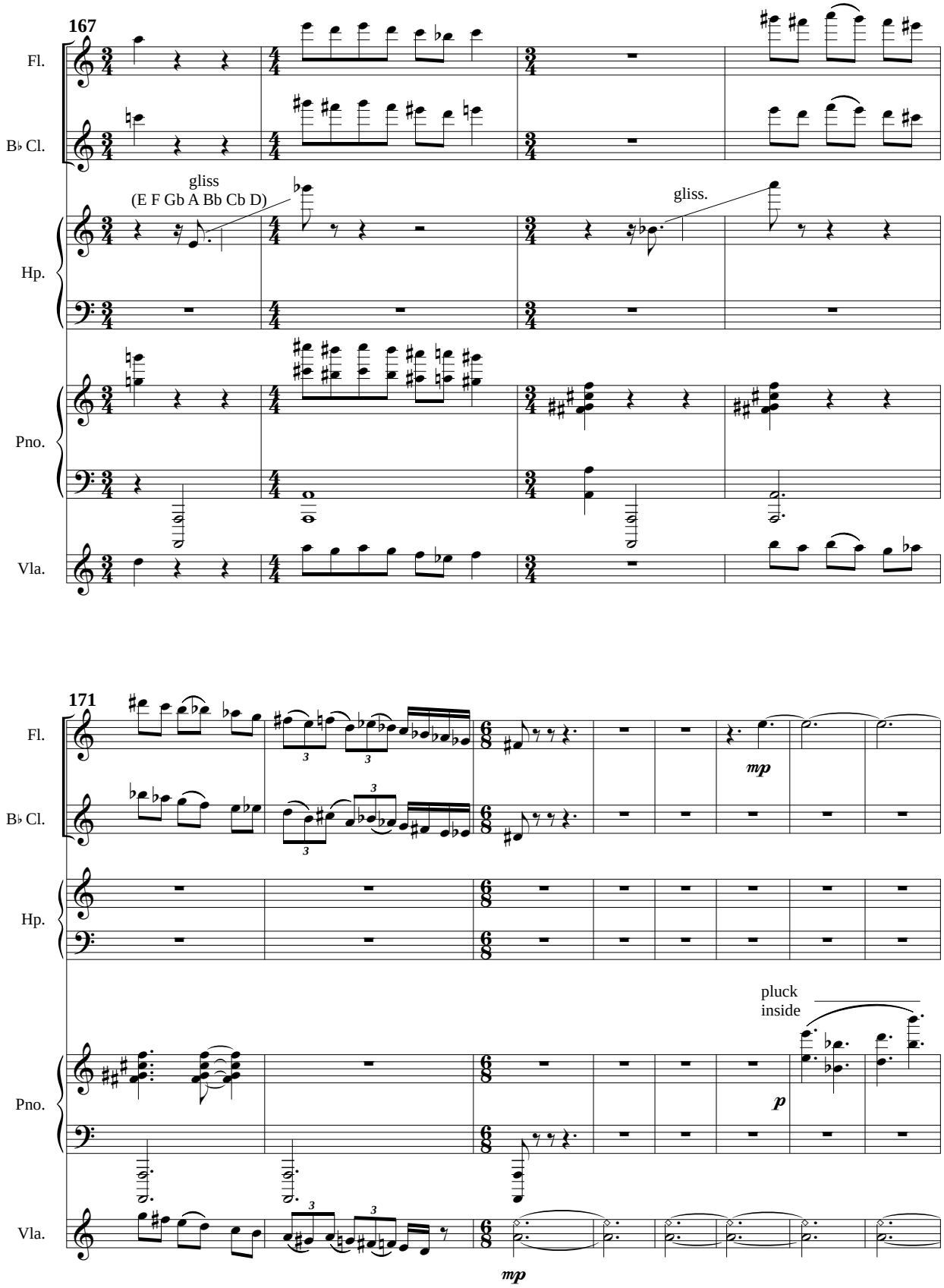

129
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp
f
134
p
mp

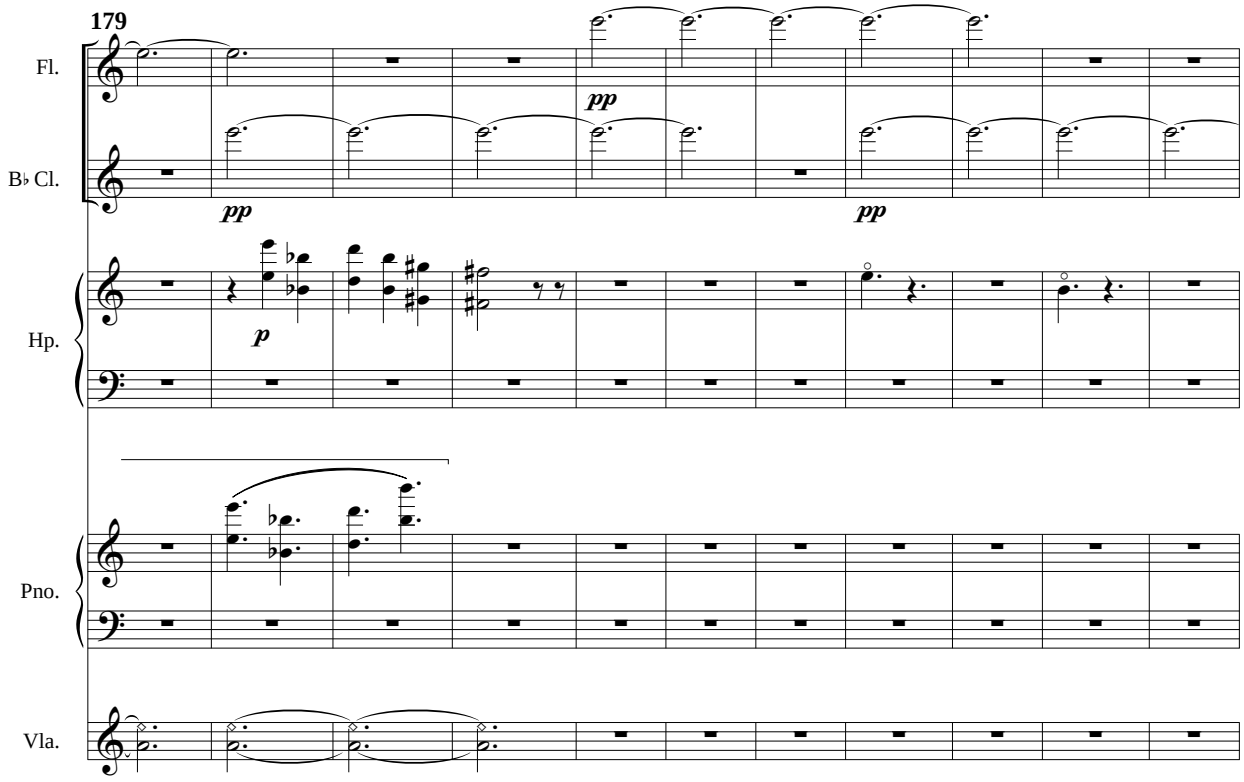

139
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mp

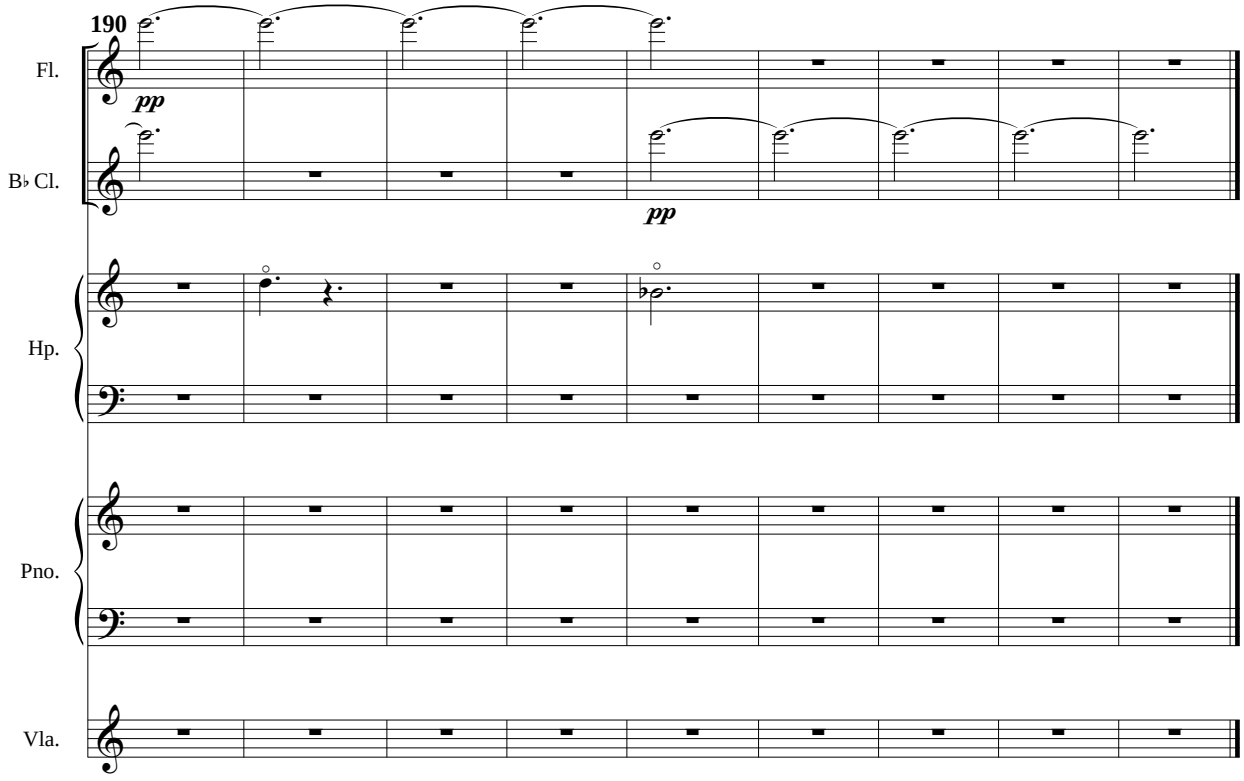

144
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mf
3
3
3
3


149
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
154
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
mf
f
mf
mf

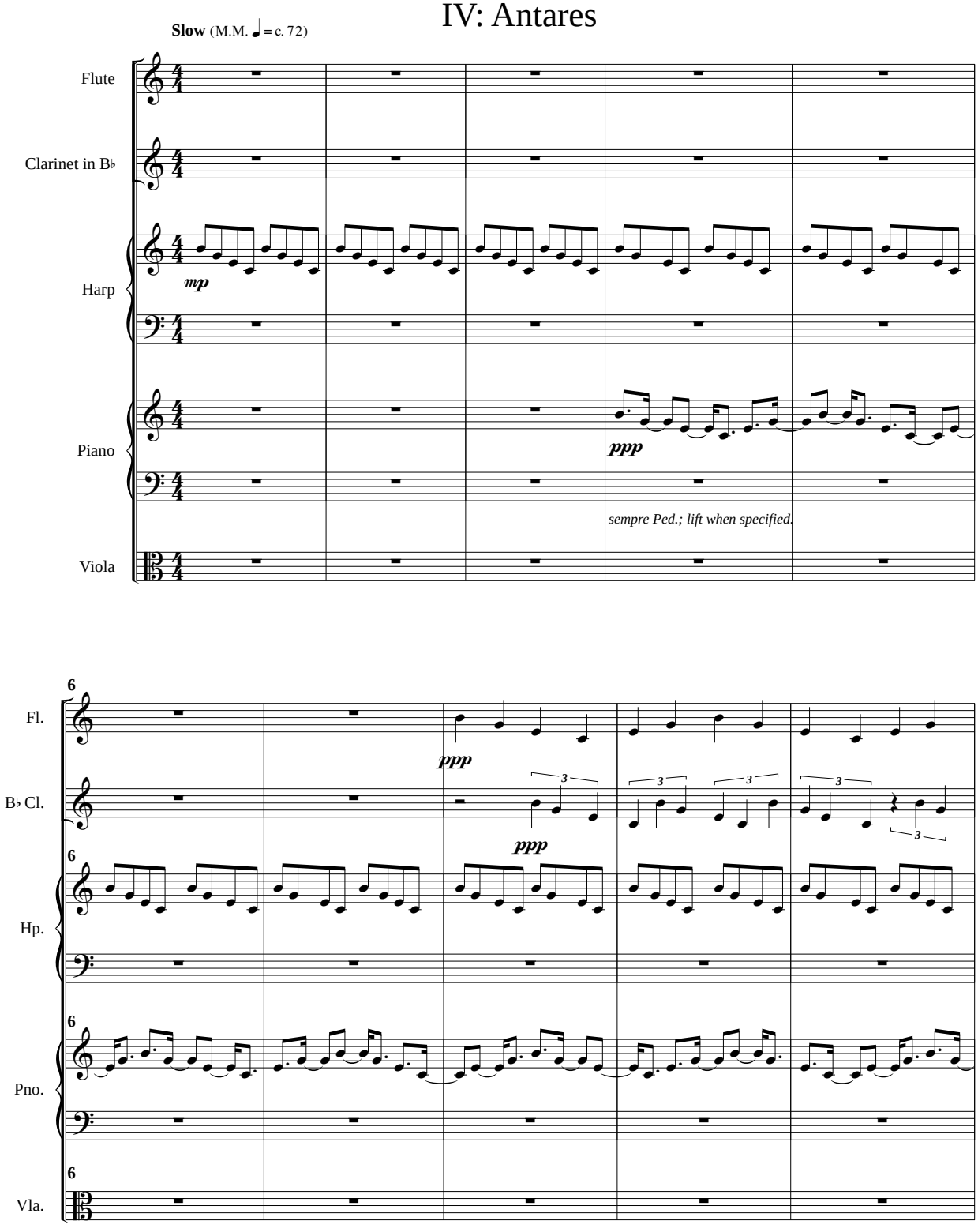

159
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
163
rit.
Grandioso ♩ = 72
fff

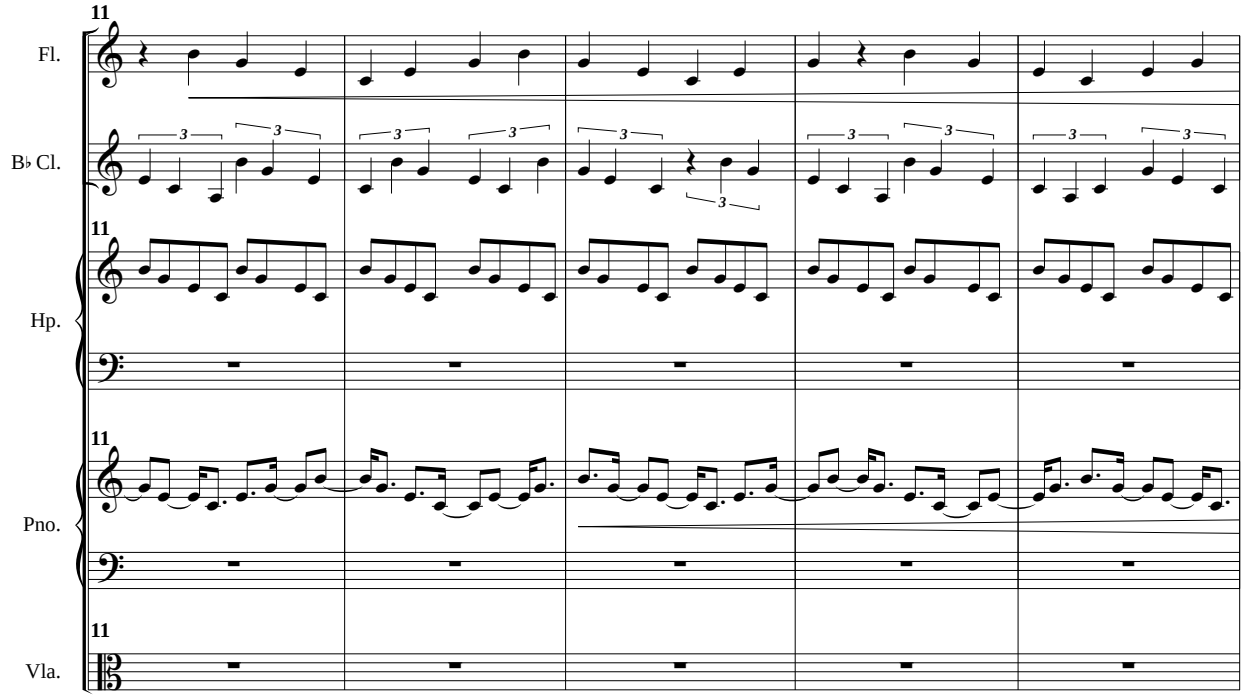

167
Fl.
B♭ Cl.
gliss
(E F Gb A Bb Cb D)
gliss.
Hp.
Pno.
Vla.
171
Fl.
B♭ Cl.
mp
Hp.
pluck
inside
Pno.
p
Vla.
mp

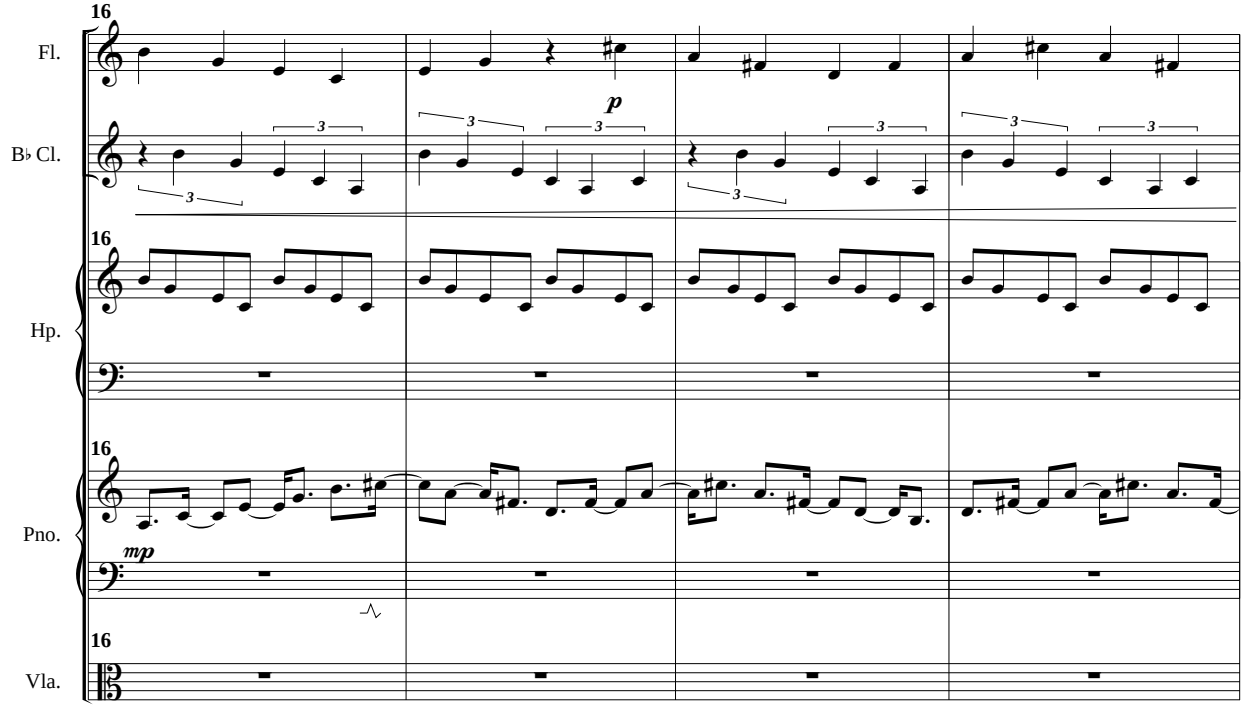

179
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp
pp
pp
p

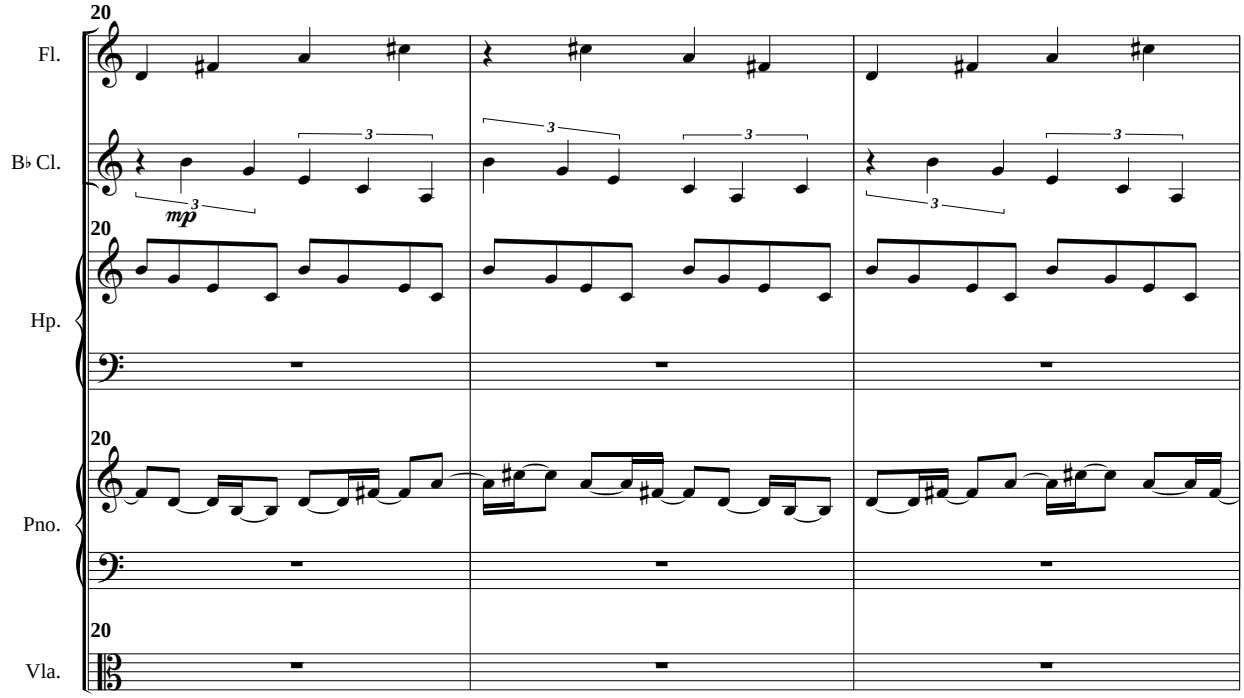

190
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp
pp

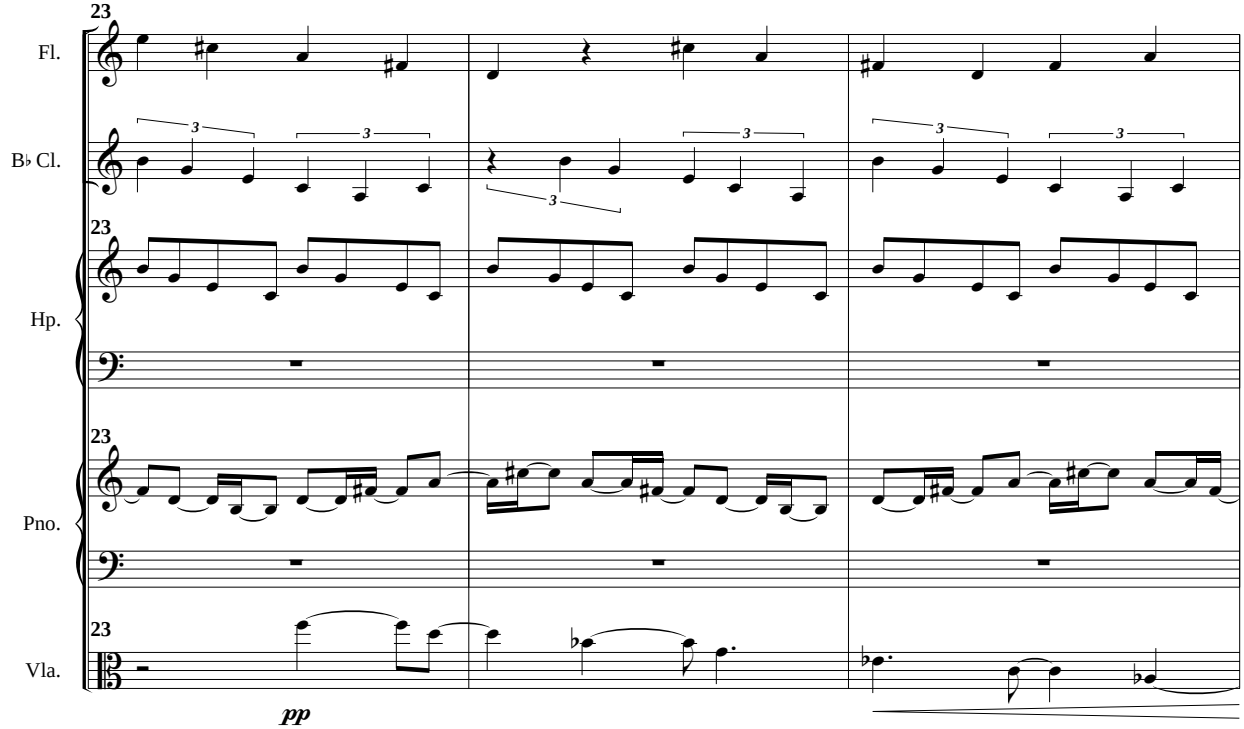
IV: Antares

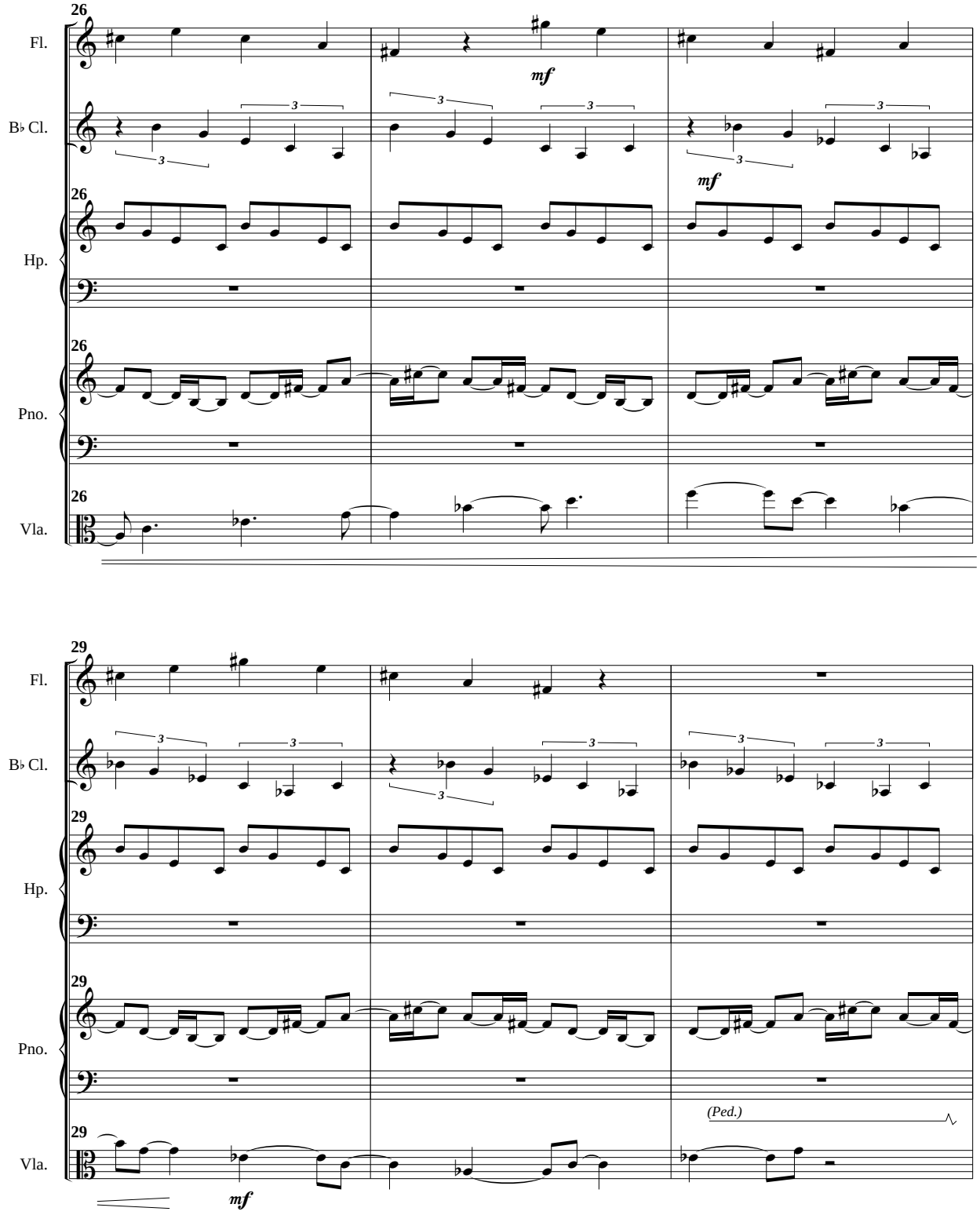

Slow (M.M. ♩ = c. 72)
Flute
Clarinet in B♭
Harp
Piano
Viola
mp
ppp
sempre Ped.; lift when specified.
6
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
ppp
ppp
3

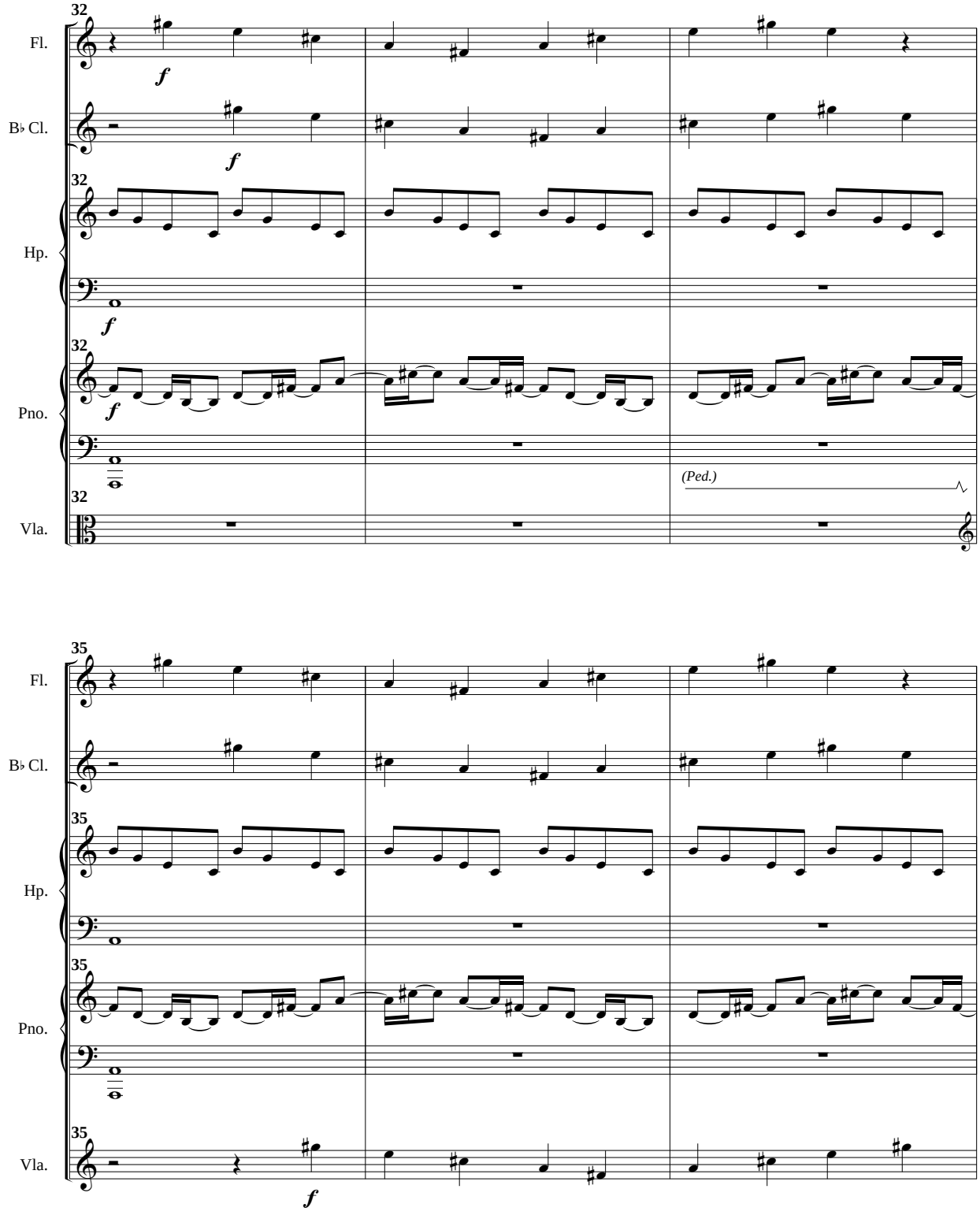

11
Fl.
B♭ Cl.
Hp.
Pno.
Vla.

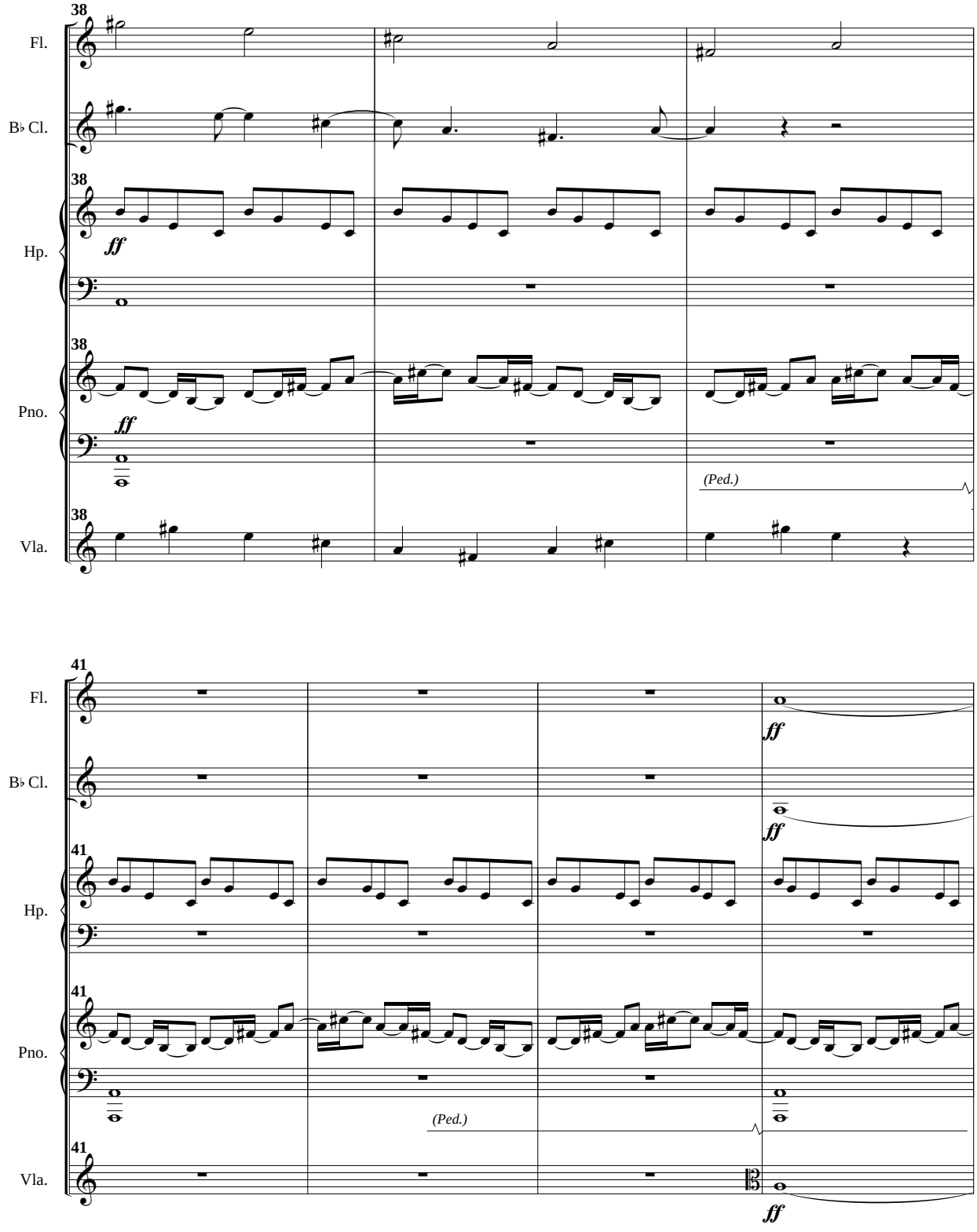

16
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
p
mp

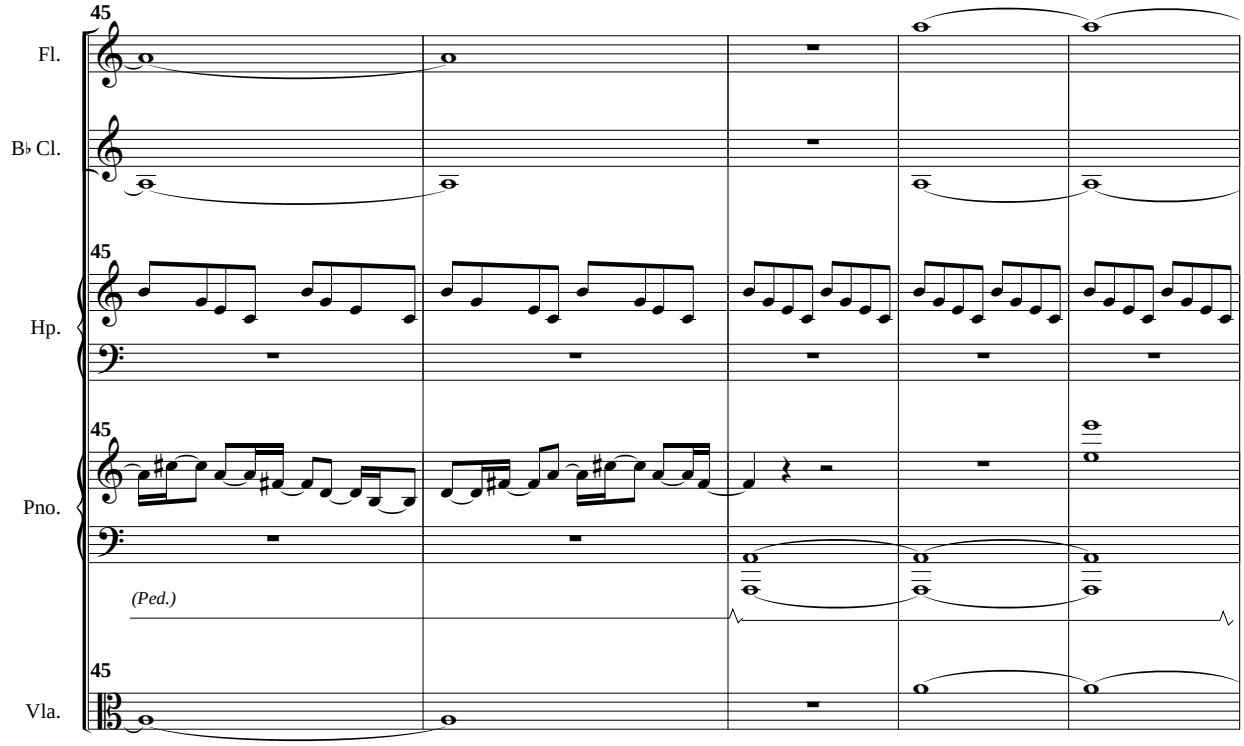

20
Fl.
B♭ Cl.
mp
Hp.
Pno.
Vla.

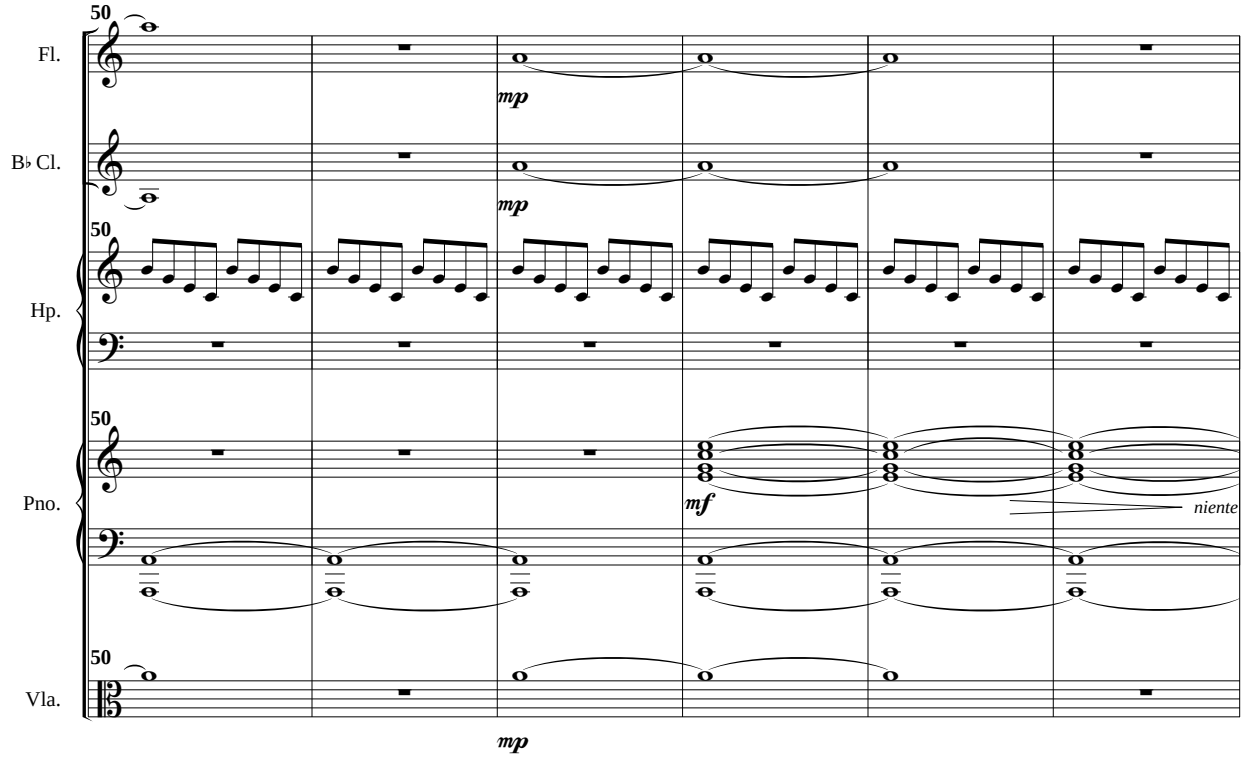

23
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
pp

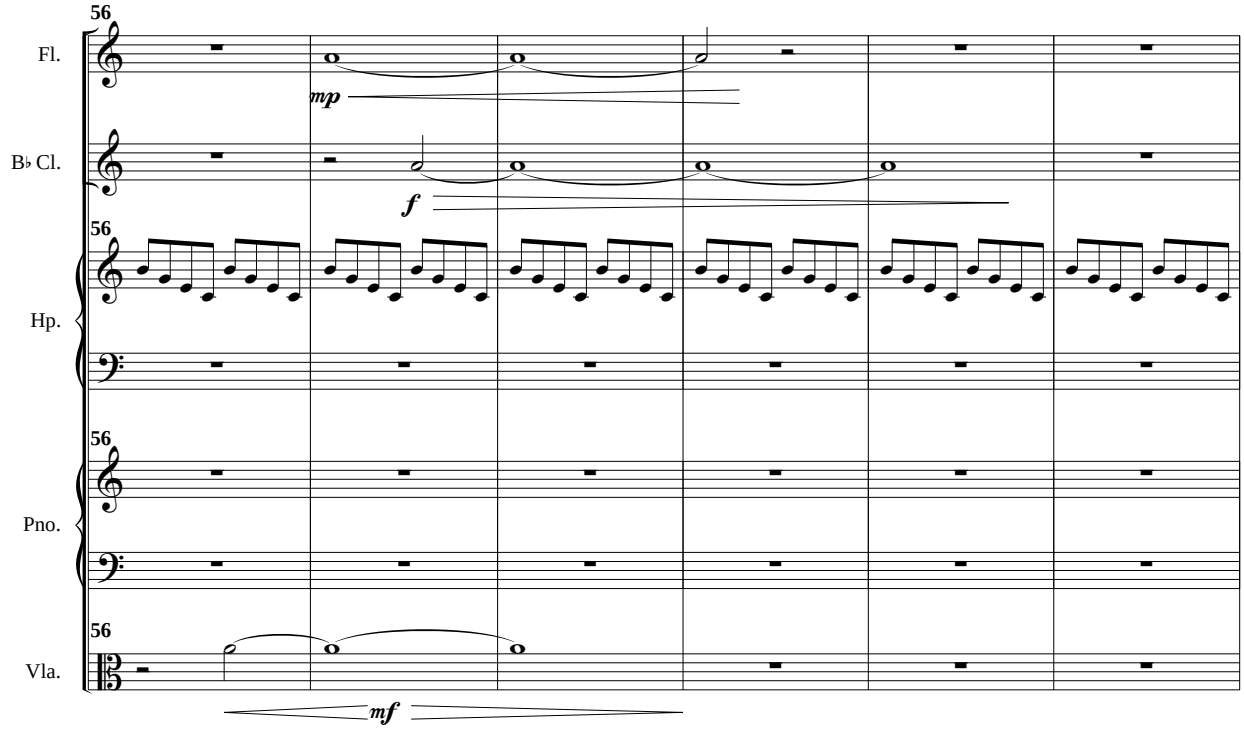

26
Fl.
mf
B♭ Cl.
3
mf
Hp.
Pno.
Vla.
29
(Ped.)
mf

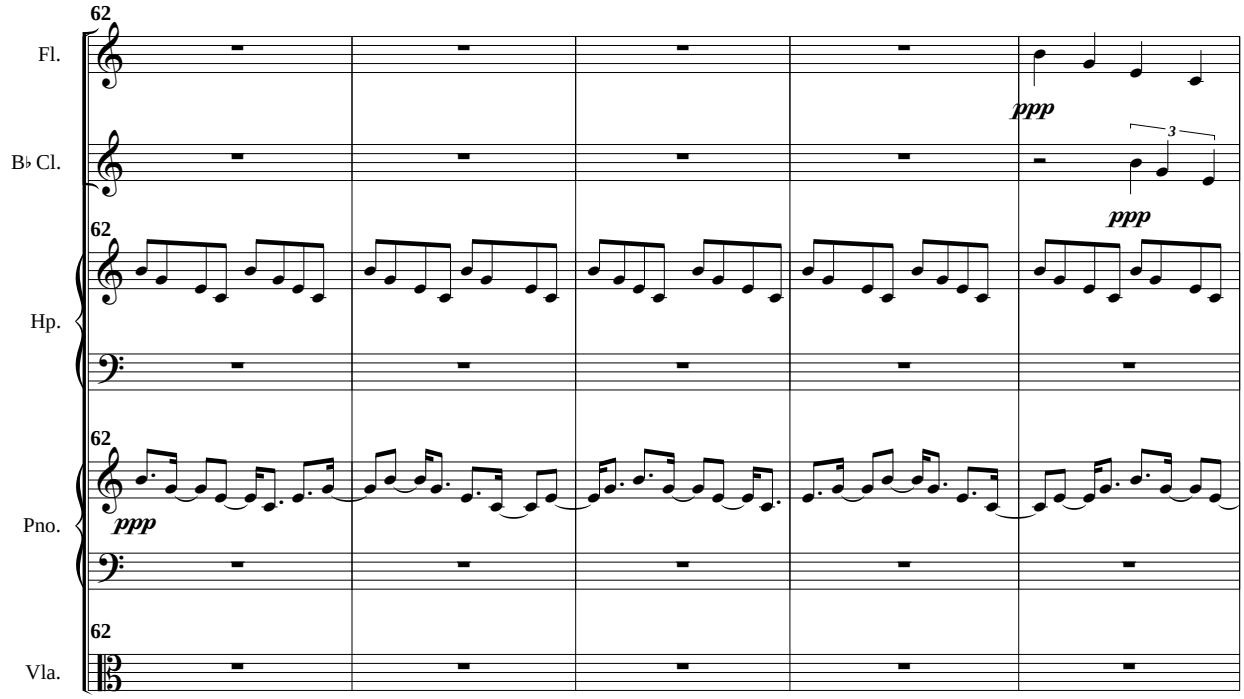

32
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
f
(Ped.)
35

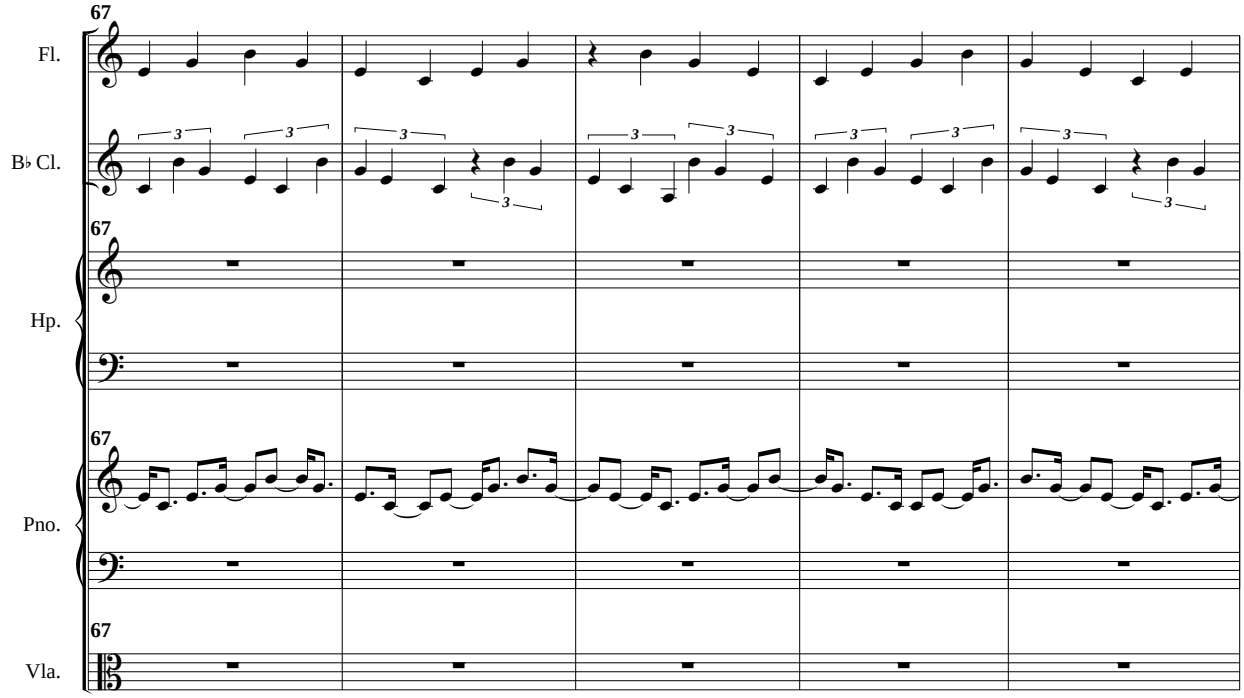

38
Fl.
B♭ Cl.
Hp.
Pno.
Vla.
ff
(Ped.)
41
ff
(Ped.)

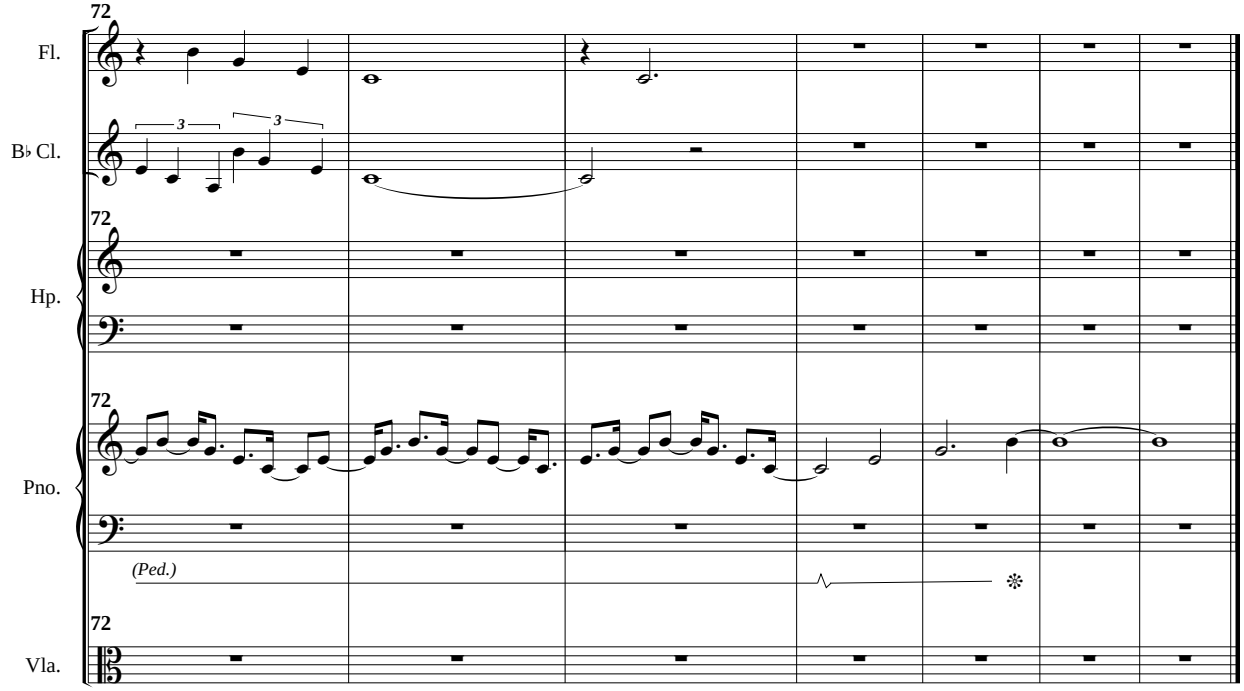

45
Fl.
B♭ Cl.
45
Hp.
45
Pno.
(Ped.)
45
Vla.


50
Fl.
mp
B♭ Cl.
mp
50
Hp.
50
Pno.
mf
niente
50
Vla.
mp


56
Fl.
mp
B♭ Cl.
f
56
Hp.
56
Pno.
56
Vla.
mf


62
Fl.
ppp
B♭ Cl.
3
ppp
62
Hp.
62
Pno.
ppp
62
Vla.


67
Fl.
B♭ Cl.
67
Hp.
67
Pno.
67
Vla.


72
Fl.
B♭ Cl.
72
Hp.
72
Pno.
(Ped.)
72
Vla.